

REPORT NOS. 208-TRC-94-008
212-TRC-94-008
301-TRC-94-008

VEHICLE SAFETY COMPLIANCE TESTING
FOR OCCUPANT CRASH PROTECTION,
WINDSHIELD MOUNTING, WINDSHIELD ZONE INTRUSION,
AND FUEL SYSTEM INTEGRITY

GENERAL MOTORS CORPORATION
1994 CADILLAC CONCOURS
4-DOOR SEDAN
NHTSA NO. CR0100
TRC TEST NO. 940131

TRANSPORTATION RESEARCH CENTER INC.
10820 STATE ROUTE 347
EAST LIBERTY, OHIO 43319



FEBRUARY 16, 1994

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF VEHICLE SAFETY COMPLIANCE (NEF-31)
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16. Abstract A 30 mph flat frontal barrier impact test was conducted on a 1994 Cadillac Concours 4-door sedan, NHTSA No. CR0100, at Transportation Research Center Inc. on January 31, 1994. This test was conducted to determine compliance with Federal Motor Vehicle Safety Standards: FMVSS 208, "Occupant Crash Protection"; 212, "Windshield Mounting"; 219 (partial), "Windshield Zone Intrusion"; and 301 "Fuel System Integrity." The barrier impact velocity was 29.3 mph. The vehicle's maximum static crush was 23.4 inches. The ambient temperature was 72° F. The driver's head injury criteria (HIC) was 425. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 52.8 g. The driver's chest maximum deflection was 1.0 inches. The driver's left and right femur maximum axial forces were 1367 pounds and 1458 pounds, respectively. The passenger's HIC was 333. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 50.3 g. The passenger's chest maximum deflection was 0.4 inches. The passenger's left and right femur maximum axial forces were 1310 pounds and 1647 pounds, respectively. The vehicle appears to comply with the applicable requirements of FMVSS 208, 212, 219 (partial), and 301.			
17. Key Words Frontal Impact 30 mph Vehicle Safety Compliance Testing: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219 (partial), "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"		18. Distribution Statement Available from: NHTSA Technical Reference Division Room 5108, (NAD-52) 400 Seventh Street, S.W. Washington, DC 20590 Attn: Mr. Robert Hornickle	
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	meters	m
yd	yards	0.9	kilometers	km
mi	miles	1.6		
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	tonnes	t
	(2000 lb)			
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

* 1 m = 2.54 (exact). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10/286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	miles	mi
		0.6		
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	Celsius temperature	5/9 (then add 32)	Fahrenheit temperature	°F

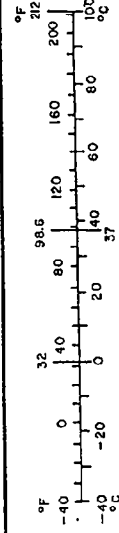


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SECTION 1.0

PURPOSE & TEST PROCEDURE

PURPOSE

This 30 mph flat frontal barrier impact test is part of the Federal Motor Vehicle Safety Standards (FMVSS) 208, 212, 219 (partial), and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center Inc. (TRC) under Contract No. DTNH22-90-D-22121. The purpose of this test was to determine if the subject vehicle, a 1994 Cadillac Concours 4-door sedan, NHTSA No. CR0100, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," in the flat frontal barrier impact mode.

TEST PROCEDURE

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-08. Data was obtained relative to FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle was instrumented with seven (7) accelerometers to measure longitudinal axis accelerations and one (1) accelerometer to measure vertical axis acceleration. The vehicle's specified impact velocity range was 28.9 to 29.9 mph. The vehicle impacted a flat frontal barrier.

The test vehicle contained two (2) Part 572 E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedure specified in Appendix B and Optional Appendix C of the Laboratory Test Procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces. Each Part 572 E dummy was instrumented with a chest potentiometer to measure longitudinal deflection and neck load cells to measure longitudinal, lateral, and vertical forces and moments.

The thirty-eight (38) data channels were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 12,500 samples per second and processed per sections 12.8 and 12.9 of the Laboratory Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and fourteen (14) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 208, 212, 219 (partial) and 301 data are presented in Section 3.0. The vehicle, occupant, and camera measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots.

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This flat frontal barrier test was conducted at TRC on January 31, 1994.

The test vehicle, a 1994 Cadillac Concours 4-door sedan, NHTSA No. CR0100, appeared to comply with the performance requirements of FMVSS 208, 212, 219 (partial), and 301 in the flat frontal barrier impact mode. The Head Injury Criteria (HIC) calculations were less than 1000, the chest resultant accelerations did not exceed 60 g's, the chest deflection did not exceed 3 inches, and the axial forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572 E dummies seated in the front outboard designated seating positions. The vehicle's restraint system met the applicable comfort and convenience requirements. The windshield periphery retention was 100 percent. There was no penetration into any portion of the windshield. No fluid spilled from the vehicle's fuel system following the impact or during the static rollover test.

The test vehicle was equipped with airbags at the driver's and right front passenger's seating positions. The vehicle's test weight was 4500 pounds. The vehicle's impact speed was 29.3 mph. The vehicle's maximum static crush was 23.4 inches.

The driver's HIC was 425. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 52.8 g. The driver's chest maximum deflection was 1.0 inches. The driver's left and right femur maximum axial forces were 1367 pounds and 1458 pounds, respectively.

The right front passenger's HIC was 333. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 50.3 g. The passenger's chest maximum deflection was 0.4 inches. The right front passenger's left and right femur maximum axial forces were 1310 pounds and 1647 pounds, respectively.

There was no loss of windshield periphery retention.

There was no penetration through the windshield.

Following the impact, no fluid spilled from the vehicle's fuel system prior to the static rollover test or during any portion of the static rollover test.

DATA ACQUISITION EXPLANATIONS

The right front passenger's neck Z-axis force load cell, NEKZF2, was not functioning prior to the test. The data acquisition circuit was checked before the test and again after the test. The cause for the malfunction could not be found.

The driver's neck Y-axis force load cell, NEKYF1, recorded a data shift from 42 to 72 milliseconds. The data acquisition circuit was checked after the test. The cause for the data shift could not be found.

The following data channels recorded a questionable data spike at 46 milliseconds:

- CSTXG1 - Driver's chest X-axis accelerometer
- CSTXD1 - Driver's chest deflection potentiometer
- HEDXG2 - Passenger's head X-axis accelerometer
- HEDYG2 - Passenger's head Y-axis accelerometer
- HEDZG2 - Passenger's head Z-axis accelerometer
- NEKXF2 - Passenger's neck X-axis shear force load cell
- NEKYF2 - Passenger's neck Y-axis shear force load cell
- NEKXM2 - Passenger's neck moment about X-axis load cell
- NEKZM2 - Passenger's neck moment about Z-axis load cell
- CSTXG2 - Passenger's chest X-axis accelerometer
- CSTYG2 - Passenger's chest Y-axis accelerometer
- CSTZG2 - Passenger's chest Z-axis accelerometer
- LFMF2 - Passenger's left femur force load cell
- BCLXG1 - Left brake caliper X-axis accelerometer
- BCRXG1 - Right brake caliper X-axis accelerometer
- TRRXG1 - Right rear seat X-axis accelerometer
- RDKZG1 - Vehicle rear center Z-axis accelerometer

The data spikes affected the driver's and passenger's chest resultant acceleration calculations and the passenger's head resultant acceleration calculation.

The right brake caliper, BCRXG1, recorded a data shift at 165 milliseconds and after. The data acquisition circuit was checked after the test. No cause for the data shift could be found.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.:	CR0100	
TEST TYPE:	Frontal Barrier Impact	
TEST DATE:	01/31/94	
TEST TIME:	1600	
AMBIENT TEMPERATURE		
AT IMPACT AREA:	72° F	
VEHICLE YEAR/MAKE/ MODEL/BODY STYLE:	1994/Cadillac/Concours/4-door sedan	
VEHICLE TEST WEIGHT:	4500 lb	
IMPACT ANGLE ¹ :	0°	
IMPACT VELOCITY ² :		
PRIMARY:	29.3 mph	
SECONDARY:	29.3 mph	
MAXIMUM STATIC CRUSH:	23.4 in	
AVERAGE REBOUND:	27.8 in	
NUMBER OF CAMERAS:		
Real-time:	2	
High-speed:	14	
DOOR OPENING DATA:		
LEFT FRONT/RIGHT FRONT:	Easy/Easy	
LEFT REAR/RIGHT REAR:	Easy/Easy	
DUMMIES:	<u>Driver #230</u>	<u>Passenger #314</u>
TYPE:	Part 572 E	Part 572 E
LOCATION:	Left front	Right front
RESTRAINT:	Airbag	Airbag
NUMBER OF DATA CHANNELS:	15	15
FRONT SEAT DATA:		
SEAT TRACK FAILURE:	None	None
SEAT BACK FAILURE:	None	None
VISIBLE DUMMY CONTACT POINTS:		
HEAD:	Airbag and head restraint	Airbag
CHEST:	Airbag	Airbag
ABDOMEN:	None	None
LEFT KNEE:	Instrument panel	Instrument panel
RIGHT KNEE:	Instrument panel	Instrument panel

¹With respect to tow track centerline.

²Speed trap measurement (± .05 mph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE YEAR/MAKE/
MODEL\BODY STYLE: 1994/Cadillac/Concours/4-door sedan
COLOR: Blue
VIN: 1G6KF52Y3RU227974
NHTSA NO.: CR0100

ENGINE DATA:
PLACEMENT: _____ LONGITUDINAL/INLINE X TRANSVERSE/LATERAL
CYLINDERS: 8
DISPLACEMENT: 4.6 liters
TRANSMISSION DATA: 4 SPEED, _____ MANUAL, X AUTOMATIC, _____ OVERDRIVE
FINAL DRIVE: X FWD, _____ RWD, _____ 4WD

DATE VEHICLE RECEIVED: 12/29/93
ODOMETER READING: 61
DEALER'S NAME Crestview Cadillac, Inc.
AND ADDRESS: P.O. Box 647
Dublin, OH 43017

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	Yes
POWER SEATS	Yes	TILTING STEERING WHEEL	Yes
POWER WINDOWS	Yes	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	Yes
RADIO	Yes	ANTI-SKID BRAKE	Yes
CLOCK	Yes	REAR WINDOW DEFROSTER	YES
POWER DOOR LOCKS	Yes	OTHER	None

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: General Motors Corporation
DATE OF MANUFACTURE: 11/93
VIN: 1G6KF52Y3RU227974
GVWR: 5140 lb
GAWR: FRONT: 2784 lb
REAR: 2356 lb

TABLE 2 TEST VEHICLE INFORMATION, CONT'D.

SIZE OF TIRES ON VEHICLE: P225/60R16
TIRE PRESSURE WITH MAXIMUM
CAPACITY VEHICLE LOAD: FRONT: 44 psi
REAR: 44 psi
SPARE TIRE: X SPACE SAVER STANDARD
TYPE OF SEATS: FRONT: Split Bench
REAR: Bench

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P225/60R16
RECOMMENDED COLD TIRE PRESSURE: FRONT: 30 psi; REAR: 30 psi
DESIGNATED SEATING CAPACITY: 3 FRONT 3 REAR 6 TOTAL
VEHICLE CAPACITY WEIGHT: 1102 lb

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:

The label was located on the driver's door.

TEST VEHICLE ATTITUDES:

DELIVERED ATTITUDE:	LF: 28.1 in;	RF: 28.4 in;	LR: 18.8 in;	RR: 19.0 in
FULLY LOADED ATTITUDE:	LF: 27.9 in;	RF: 28.2 in;	LR: 16.8 in;	RR: 17.2 in
PRE-TEST ATTITUDE:	LF: 27.8 in;	RF: 27.9 in;	LR: 16.6 in;	RR: 16.8 in
POST-TEST ATTITUDE:	LF: 29.6 in;	RF: 29.5 in;	LR: 18.1 in;	RR: 18.1 in

TABLE 2 TEST VEHICLE INFORMATION, CONT'D.

WEIGHT OF TEST VEHICLE AS RECEIVED (WITH MAXIMUM FLUIDS):

RIGHT FRONT	1248	lb	RIGHT REAR	733	lb
LEFT FRONT	1239	lb	LEFT REAR	762	lb
TOTAL FRONT WEIGHT	2487	lb	(62.5% OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1495	lb	(37.5% OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	3982	lb			

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (3982 lb)

VCW = VEHICLE CAPACITY WEIGHT = 1102 lb

DSC = DESIGNATED SEATING CAPACITY (6)

$RCLW^1 = VCW - 150 (DSC) = 1102 - 150(6) = 202 \text{ lb}$

TARGET TEST WEIGHT = UDW + RCLW¹ + (NUMBER OF HYBRID III DUMMIES
X 167 lb PER DUMMY)

TARGET TEST WEIGHT = 3982 + 202 + 334 = 4518 lb

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 184 lb OF CARGO WEIGHT:

RIGHT FRONT	1288	lb	RIGHT REAR	947	lb
LEFT FRONT	1285	lb	LEFT REAR	980	lb
TOTAL FRONT WEIGHT	2573	lb	(57.2% OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1927	lb	(42.8% OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	4500	lb	(0.4% UNDER TARGET TEST WEIGHT)		

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: 100 lb

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG REARWARD OF FRONT WHEEL CENTERLINE: 48.8 in

WHEELBASE: 114.0 in

¹ Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's rated cargo and luggage weight or 300 pounds, whichever is less.

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 940131
NHTSA NO.: CR0100
TEST DATE: 01/31/94
TEST TIME: 1600
TEST TYPE: Frontal Barrier Impact
IMPACT ANGLE: 0°
AMBIENT TEMPERATURE
AT IMPACT AREA: 72° F
TEMPERATURE IN
OCCUPANT COMPARTMENT: 72° F
IMPACT VELOCITY:
PRIMARY: 29.3 mph
SECONDARY: 29.3 mph
SPECIFIED RANGE: 28.9 TO 29.9 mph

DISTANCE FROM VEHICLE TO BARRIER:

ENTERING VELOCITY TRAP: 15.0 in

EXITING VELOCITY TRAP: 2.0 in

TEST VEHICLE STATIC CRUSH:

OVERALL LENGTH OF TEST VEHICLE:

PRE-TEST: L: 201.6 in; C: 210.0 in; R: 202.0 in

POST-TEST: L: 186.2 in; C: 186.6 in; R: 185.5 in

TOTAL CRUSH: L: 15.4 in; C: 23.4 in; R: 16.5 in

AVERAGE CRUSH: 18.4 in

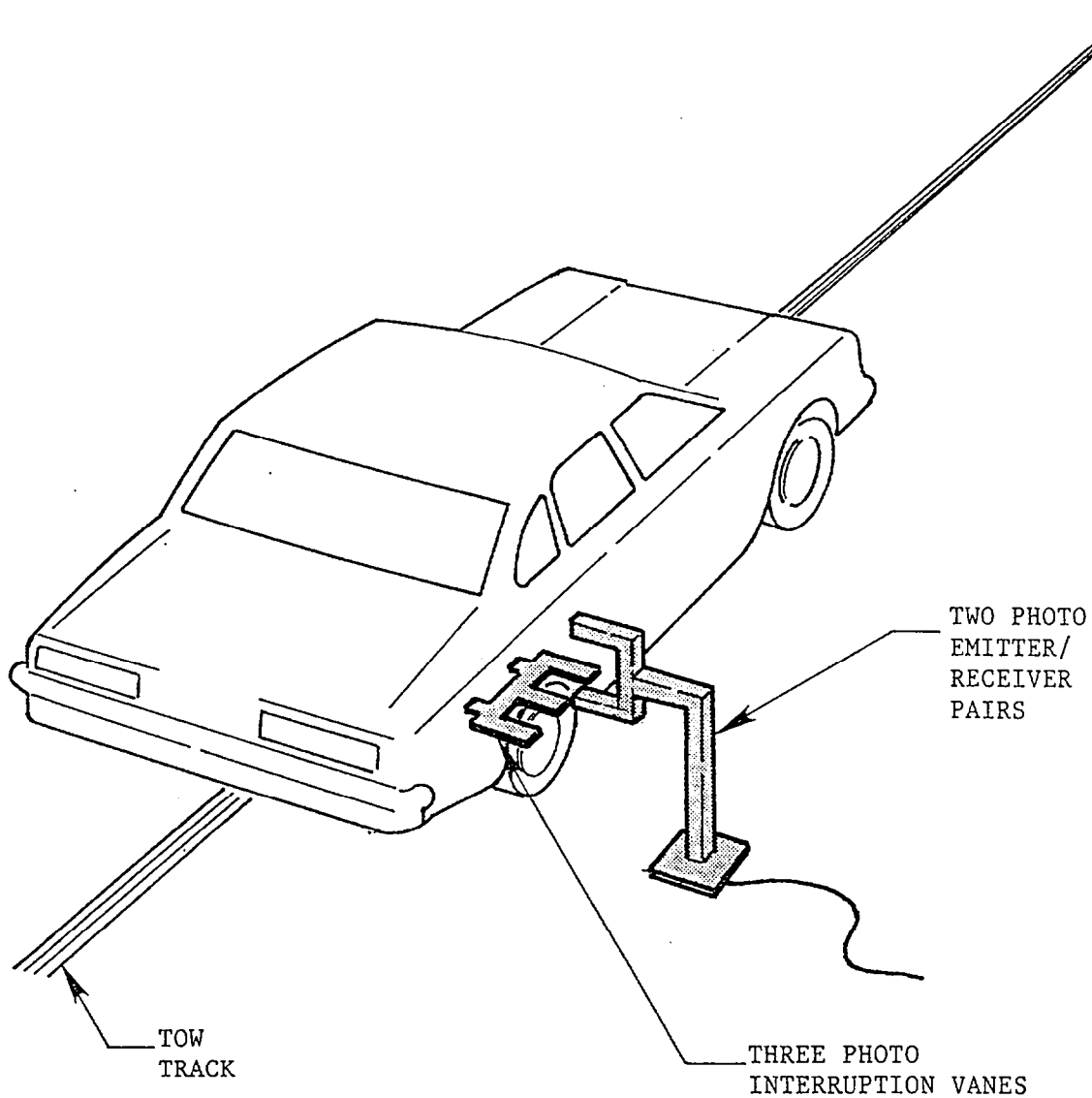
TEST VEHICLE REBOUND FROM FLAT BARRIER:

DISTANCE FROM TEST VEHICLE TO BARRIER:

L: 27.5 in; C: 27.9 in; R: 28.1 in

AVG.: 27.8 in

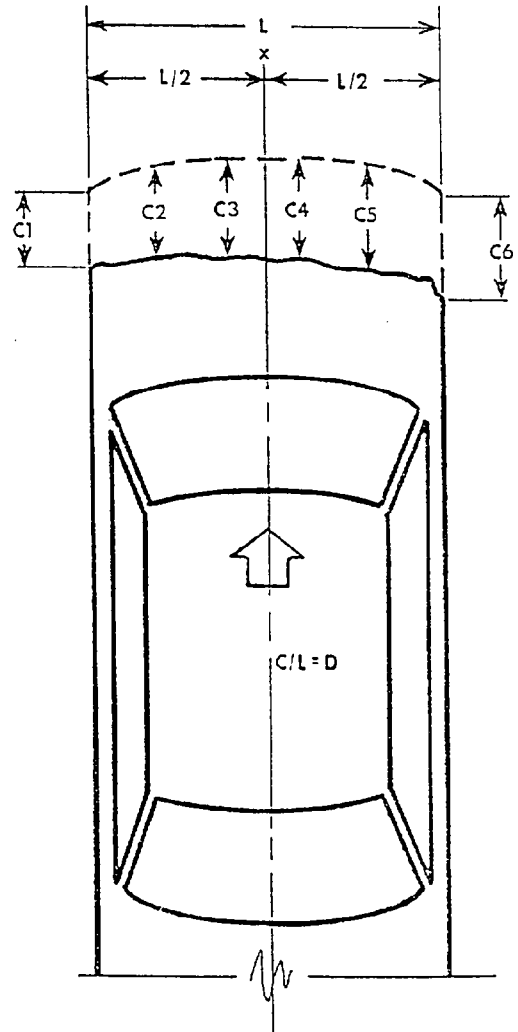
FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver two inches before impact.
The vanes have one-foot spacing.

FIGURE 2 ACCIDENT INVESTIGATION DIVISION DATA
FOR 30 MPH FRONTAL BARRIER IMPACT

NHTSA NO.: CR0100
 TEST DATE: 01/31/94
 VEHICLE YEAR/MAKE/
 MODEL/BODY STYLE: 1994/Cadillac/Concours/4-door sedan
 VEHICLE SIZE CATEGORY: Large
 VIN: 1G6KF52Y3RU227974
 BUILD DATE: 11/93
 TEST WEIGHT: 4500 lb
 VEHICLE WHEELBASE: 114.0 in
 MAXIMUM WIDTH: 76.0 in
 FRONT OVERHANG: 46.0 in



COLLISION DEFORMATION

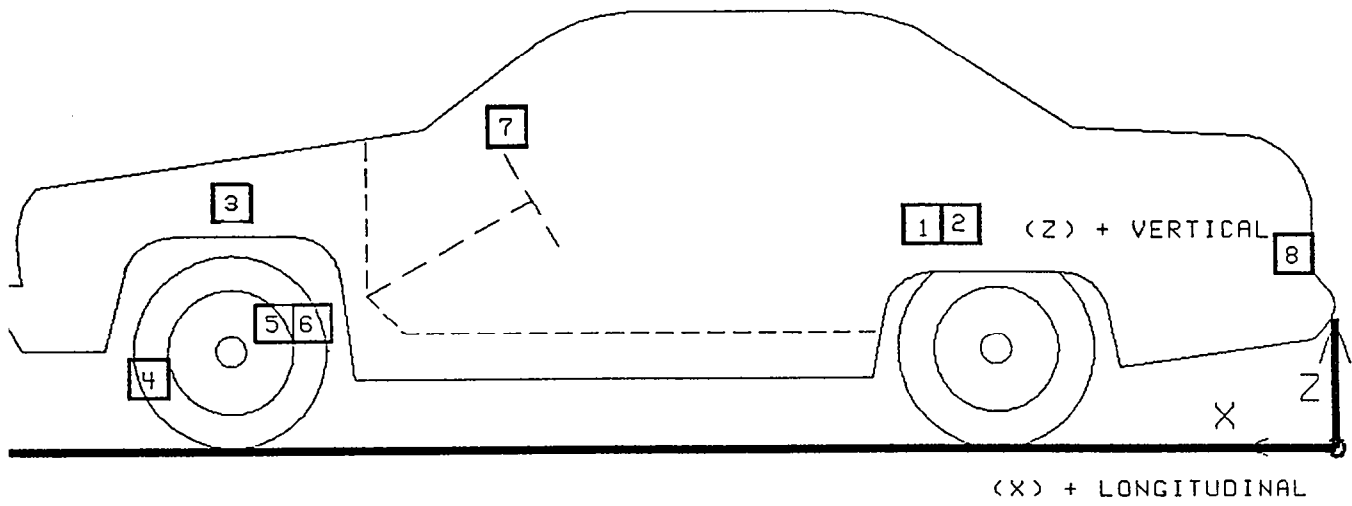
CLASSIFICATION (CDC) CODE: 12FDEW2

CRUSH DEPTH	C1:	15.4 in
MEASUREMENTS:	C2:	17.5 in
	C3:	19.8 in
	C4:	20.6 in
	C5:	19.2 in
	C6:	16.5 in

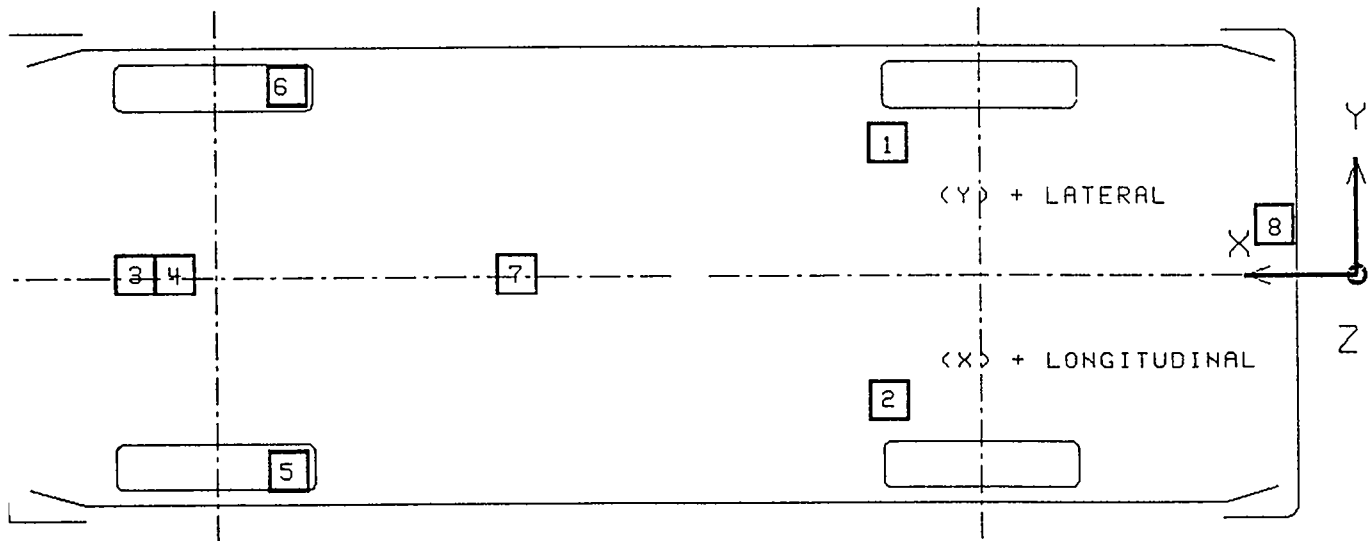
MIDPOINT OF DAMAGE: D: Vehicle Longitudinal Centerline

LENGTH OF DAMAGED
 REGION: L: 60.5 in

FIGURE 3 VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 940131

No. LOCATION	X*	Y*	Z*	POSITIVE		NEGATIVE	
				DIRECTION		DIRECTION	
				MAX G MSEC		MAX G MSEC	
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE 75.6	26.8	11.0				
	POST 75.8	26.8	14.2				
				4.6	10.5	35.1	70.7
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL ¹	PRE 75.9	-26.8	11.8				
	POST 75.0	-26.8	14.3				
				5.4	10.6	28.4	80.1
3 ENGINE TOP LONGITUDINAL	PRE 173.5	1.1	32.6				
	POST 164.9	0.5	31.1				
				23.1	58.5	99.6	44.2
4 ENGINE BOTTOM LONGITUDINAL	PRE 169.5	-9.5	9.1				
	POST 162.8	-10.5	12.6				
				20.4	58.8	76.4	42.8

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY CONTINUED

TEST NUMBER 940131

No. LOCATION	X*	Y*	Z*	POSITIVE		NEGATIVE	
				DIRECTION		DIRECTION	
				MAX G	MSEC	MAX G	MSEC
5 RIGHT BRAKE CALIPER	PRE 169.5	-24.5	14.0				
	POST 164.8	-25.5	10.5				
LONGITUDINAL ¹			47.7	215.0		84.5	46.0
6 LEFT BRAKE CALIPER	PRE 169.0	24.5	13.4				
	POST 166.2	26.5	13.0				
LONGITUDINAL ¹			2.9	95.2		60.9	54.6
7 INSTRUMENT PANEL CENTER	PRE 143.5	0.0	38.8				
	POST 143.2	0.0	41.2				
LONGITUDINAL			67.9	37.1		62.9	50.4
8 VEHICLE REAR CENTER	PRE 12.4	-2.2	15.8				
	POST 12.4	-2.2	19.8				
VERTICAL ¹			11.2	76.2		9.2	110.6

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM REAR BUMPER
 Y: + LEFTWARD FROM VEHICLE CENTERLINE
 Z: + UPWARD FROM GROUND LEVEL

¹See DATA ACQUISITION EXPLANATIONS

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT NO.: DTNH22-90-D-22121
FROM: Transportation Research Center Inc.
10820 State Route 347
East Liberty, OH 43319

TO: Mr. Charles Case, COTR
Office of Vehicle Safety Compliance

The following vehicle has been subjected to testing for FMVSS 208. The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager/NAD-30, with a carbon copy to the responsible testing office. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

NHTSA NO.: CR0100
VEHICLE YEAR/MAKE/
MODEL/BODY STYLE: 1994/Cadillac/Concours/4-door sedan
BODY COLOR: Blue
VIN: 1G6KF52Y3RU227974
ODOMETER (ARRIVAL): 61 DATE: 12/29/93
ODOMETER (COMPLETION): 62 DATE: 01/31/94
COST: \$35,357.60

AIR CONDITIONER	Yes	CONSOLE	No	BRAKES	POWER ABS
TINTED GLASS	Yes	TACHOMETER	No	FRONT	Disc
POWER STEERING	Yes	SPEED CONTROL	Yes	REAR	Drum
POWER WINDOWS	Yes	REAR WINDOW DEF.	Yes	FRONT SEATS	Power
POWER DOOR LOCKS	Yes	SUN/MOON ROOF	No	SEAT TYPE	
RADIO	Yes	T-TOP	No	Front:	Split bench
CLOCK	Yes	TILT STEERING WHEEL	Yes	Rear:	Bench
ROOF RACK	No	OTHER OPTIONS: Theft		NO. OF SEATS	6
		deterrent, heated front seats			

ENGINE: 8 CYLINDERS
LITERS: 4.6
TRANSMISSION: 4-speed automatic
DRIVE TYPE: Front-wheel drive
TIRE SIZE: P225/60R16
GASOLINE TYPE: Unleaded

EQUIPMENT THAT IS NO LONGER ON THE VEHICLE AS NOTED ABOVE: rear seat,
spare tire

EXPLANATION: Equipment removed to allow installation of data acquisition
system.

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING, CONT'D.

VEHICLE CONDITION: Vehicle was subjected to a 30 mph crash test. There is severe structural damage. Various interior and exterior portions of the vehicle have been painted and have had holes drilled to facilitate attachment of instrumentation. Various trim and body parts have been removed including the rear seats. Stoddard solvent replaced the fuel in the fuel system and engine. THE VEHICLE IS FOR SALVAGE ONLY AND IS NOT TO BE REPAIRED FOR HIGHWAY USE.

SECTION 3.0

FMVSS 208, 212, 219 (partial), AND 301 DATA

TABLE 5 DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION

	HEAD				CHEST		
	X	Y	Z	R	X	Y	Z
DRIVER ¹	-57.0 g	-9.6 g	21.1 g	57.6 g	-54.2 g	-8.1 g	5.0 g
PASSENGER ¹	-52.1 g	-35.8 g	-31.6 g	59.7 g	-48.0 g	-51.6 g	-23.5 g

MAXIMUM FEMUR COMPRESSIVE FORCE

	LEFT FEMUR	RIGHT FEMUR
DRIVER	1367 lbf	1458 lbf
PASSENGER ¹	1310 lbf	1647 lbf

HEAD INJURY CRITERIA²

	HIC	TIME t ₁	TIME t ₂
DRIVER	425	73.9 ms	109.9 ms
PASSENGER	333	79.2 ms	109.0 ms

CHEST MAXIMUM RESULTANT ACCELERATION³

	ACCEL.	TIME t ₁	TIME t ₂
DRIVER	52.8 g	98.3 ms	101.3 ms
PASSENGER	50.3 g	92.6 ms	95.6 ms

MAXIMUM CHEST DEFLECTION

DRIVER ¹	1.0 in
PASSENGER	0.4 in

¹See DATA ACQUISITION EXPLANATIONS

²As defined in FMVSS No. 208

³Defined as equal to or exceeding 0.003 sec. duration

DUMMY KINEMATIC SUMMARY

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The driver dummy was restrained by the airbag. The dummy's head rotated rearward as the dummy rebounded rearward into the seat. The dummy's head contacted the head restraint. The driver dummy came to rest in the driver's seat.

Right Front Passenger Dummy

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The right front passenger dummy was restrained by the airbag. The dummy rebounded rearward into the seat back as the dummy's head rotated forward and then rearward contacting the head restraint. The right front passenger dummy came to rest in the right front passenger's seat.

TABLE 6 FMVSS 208 COMFORT & CONVENIENCE DATA FOR MANUAL SEAT BELTS

MAKE/MODEL/BODY STYLE: Cadillac/Concours/4-door sedan
NHTSA NO.: CR0100
VIN: 1G6KF52Y3RU227974
DATE OF MANUFACTURE: 11/93

WEBBING TENSION-RELIEVING DEVICE:

DO OUTBOARD SEATING POSITION SEAT BELTS HAVE WEBBING TENSION - RELIEVING DEVICES?(check one): NO

IF YES:

MAXIMUM SLACK RECOMMENDED IN OWNER'S MANUAL: _____ INCHES

DOES OWNER'S MANUAL WARN THAT INTRODUCING SLACK BEYOND THE AMOUNT SPECIFIED CAN SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF THE SHOULDER BELT? _____ YES _____ NO

IF NO, EXPLAIN:

THE WEBBING TENSION-RELIEVING DEVICE IS CANCELLED WHEN

(check one): _____ The adjacent door is opened.
_____ The latch plate is released from the buckle.
_____ A manual means is activated on a open-body vehicle without doors.

OPEN-BODY VEHICLE (without doors): DOES THE MANUAL-MEANS TO CANCEL THE WEBBING TENSION - RELIEVING DEVICE OPERATE PROPERLY?

_____ YES _____ NO

IF NO, EXPLAIN:

BELT CONTACT FORCE:

BELT CONTACT FORCE ON CHEST OF TEST DUMMY: 0.1 POUNDS

_____ NOT APPLICABLE, THE VEHICLE'S SEAT BELT SYSTEM INCLUDED A WEBBING TENSION - RELIEVING DEVICE.

TABLE 6 FMVSS 208 COMFORT & CONVENIENCE DATA FOR MANUAL SEAT BELTS, CONT'D.

MAKE/MODEL/BODY STYLE: Cadillac/Concours/4-door sedan

NHTSA NO.: CR0100

VIN: 1G6KF52Y3RU227974

DATE OF MANUFACTURE: 11/93

LATCHPLATE ACCESS:

ARE THE SEAT BELT LATCHPLATES, IN THEIR NORMAL STOWED POSITION, WITHIN
THE REACH ENVELOPE? YES

DOES THE CLEARANCE TEST BLOCK MOVE UNHINDERED TO THE LATCHPLATE OR
BUCKLE? YES

RETRACTION:

SEAT BELT AUTOMATICALLY RETRACTS WHEN (check one):

 The adjacent vehicle door is open and the seat belt latchplate is
released.

 X The seat belt latchplate is released.

ARE THE STOWED SEAT BELT WEBBING AND HARDWARE PINCHED WHEN THE DOOR IS
CLOSED? NO

OPEN-BODY VEHICLE (without doors): DOES THE SEAT BELT SYSTEM FULLY
RETRACT WHEN THE WEBBING TENSION-RELIEVING DEVICE IS MANUALLY
DEACTIVATED? YES NO

TABLE 6 FMVSS 208 COMFORT & CONVENIENCE DATA FOR MANUAL SEAT BELTS, CONT'D.

MAKE/MODEL/BODY STYLE: Cadillac/Concours/4-door sedan
NHTSA NO.: CR0100
VIN: 1G6KF52Y3RU227974
DATE OF MANUFACTURE: 11/93

ACCESSIBILITY:

IS THE SEAT CUSHION REMOVABLE SO THE SEAT BACK SERVES A FUNCTION OTHER THAN SEATING? NO

IS THE SEAT REMOVABLE? NO

IS THE SEAT MOVABLE SO THE SPACE FORMERLY OCCUPIED BY THE SEAT CAN BE USED FOR A SECONDARY FUNCTION? NO

NOTE: IF ANY OF THE ABOVE ANSWERS ARE "YES", THE ACCESSIBILITY REQUIREMENTS DO NOT APPLY.

IF WEBBING IS DESIGNED TO PASS THROUGH THE SEAT CUSHION OR BETWEEN THE CUSHION AND SEAT BACK ARE ONE OF THE FOLLOWING PARTS NORMALLY ON TOP OF OR ABOVE THE SEAT CUSHION: LATCHPLATE, BUCKLE, WEBBING? Yes

ARE THE REMAINING TWO PARTS ACCESSIBLE UNDER NORMAL CONDITIONS? Yes

DO THE LATCHPLATE AND BUCKLE PASS THROUGH THE GUIDES PROVIDED AND FALL BEHIND THE SEAT WHEN THE BELT IS COMPLETELY RETRACTED (OR DETACHED IF NOT RETRACTABLE); THE SEAT IS MOVED TO ANY POSITION; AND THE SEAT BACK, IF FOLDABLE, IS FOLDED FORWARD AS FAR AS POSSIBLE AND THEN MOVED BACKWARD INTO POSITION? No

IS THE INBOARD RECEPTACLE END OF THE OUTBOARD SEATING POSITION'S SEAT BELT ACCESSIBLE WITH THE CENTER ARM REST IN ANY POSITION TO WHICH IT CAN BE ADJUSTED WITHOUT MOVING THE ARM REST FOR ACCESS? Yes

TABLE 7 FMVSS 208 SEAT BELT WARNING SYSTEM DATA

WITH OCCUPANT IN DRIVER'S POSITION AND UNIBELT IN STOWED POSITION AND IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 6 s

Duration of reminder light operation = continuous

WITH OCCUPANT IN DRIVER'S POSITION AND UNIBELT IN USE AND THE IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 0 s

(NOTE: audible warning should not operate)

Duration of reminder light operation = 0 s

WORDING OF VISUAL WARNING:

 Fasten Seat Belt

 Fasten Belt

 X Symbol from Table 2 of FMVSS 101

 Other:

TABLE 8 FMVSS 208 LABELING AND DRIVER'S MANUAL DATA

DESCRIBE LOCATION OF LABEL WHICH DESCRIBES MANUFACTURER'S MAINTENANCE OR REPLACEMENT SCHEDULE FOR CRASH-DEPLOYED OCCUPANT PROTECTION SYSTEM.

The labels were located on the driver's and passenger's sun visors

THE MANUFACTURER'S RECOMMENDED SCHEDULE IS TO: (check one)

 Replace

Repair

X Other: No regular maintenance needed.

This system: (check one)

____a. by _____ month, _____ year

 b. by miles

 c. or after a time interval of months or years.

 d. other: _____

WERE APPROPRIATE INSTRUCTIONS CONCERNING MAINTENANCE AND/OR REPLACEMENT OF THIS SYSTEM PROVIDED?

YES, owner's manual, pages 35 and 40, and on label on vehicle

WAS A DESCRIPTION OF THE FUNCTIONAL OPERATION OF THE SYSTEM PROVIDED?

YES, owner's manual, pages 38 and 39

IS THERE A REFERENCE TO THE INSTRUCTIONS AND DESCRIPTION OF THE SYSTEM ON THE LABEL? YES

WAS AN OWNER'S MANUAL PROVIDED? YES

DID THE OWNER'S MANUAL CONTAIN APPROPRIATE INFORMATION CONCERNING MAINTENANCE AND/OR REPLACEMENT AND A DESCRIPTION OF THE FUNCTIONAL OPERATION OF THE SYSTEMS? YES, pages 35 and 38 through 40

TABLE 9 FMVSS 208 READINESS INDICATOR DATA

AN OCCUPANT RESTRAINT SYSTEM THAT DEPLOYS IN THE EVENT OF A CRASH SHALL HAVE A MONITORING SYSTEM WITH A READINESS INDICATOR. A TOTALLY MECHANICAL SYSTEM IS EXEMPT FROM THIS REQUIREMENT.

IS THE SYSTEM TOTALLY MECHANICAL? NO

IF NO:

DESCRIBE THE LOCATION OF THE READINESS INDICATOR:

The readiness indicator was located on the upper center of the instrument cluster.

IS THE READINESS INDICATOR CLEARLY VISIBLE TO THE DRIVER? YES

IS A LIST OF THE ELEMENTS IN THE OCCUPANT RESTRAINT SYSTEM, BEING MONITORED BY THE READINESS INDICATOR, PROVIDED?

YES, owner's manual, pages 35 through 40

FIGURE 4 FMVSS 212 TEST DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

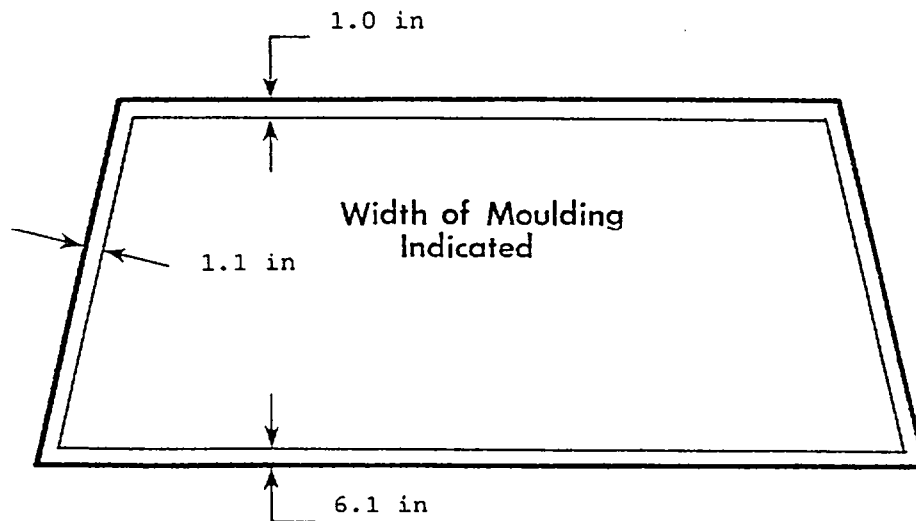
Plastic trim around outer perimeter, adhesive around inner perimeter.

FMVSS 212 REQUIREMENTS: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

WINDSHIELD PERIPHERY MEASUREMENTS:

	PRE-TEST	POST-TEST	PERCENT RETENTION
RIGHT SIDE	90.0 in	90.0 in	100
LEFT SIDE	90.0 in	90.0 in	100
TOTAL	180.0 in	180.0 in	100

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 72° F



FRONT VIEW OF WINDSHIELD¹

LOSS OF WINDSHIELD RETENTION LENGTHS: None

¹Indicate areas of loss of retention, if any, on windshield diagram.

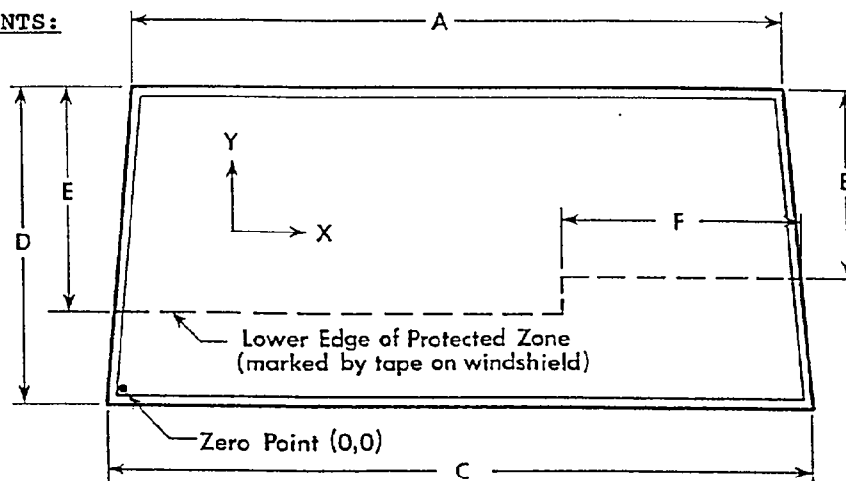
FIGURE 5 FMVSS 219 TEST DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5 inch diameter rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 0.5 inch from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

WINDSHIELD MEASUREMENTS:

A: 51.9 in
B: 19.0 in
C: 64.4 in
D: 31.9 in
E: 19.8 in
F: 30.0 in



FRONT VIEW

METHOD OF ADHERING PROTECTED ZONE TEMPLATE TO WINDSHIELD: NA

AREAS OF WINDSHIELD TEMPLATE PENETRATION
GREATER THAN 0.25 in: NA

COORDINATES	
X	Y
1.	
2.	
3.	

AREAS OF WINDSHIELD PENETRATION, BELOW THE PROTECTED ZONE,
THROUGH THE INNER SURFACE OF THE WINDSHIELD: None

1.
2.
3.

TABLE 10 FUEL SYSTEM DATA

MAKE/MODEL: Cadillac/Concours
NHTSA NO.: CR0100
FUEL SYSTEM CAPACITY: 20.0 gal (FROM OWNER'S MANUAL)
USABLE CAPACITY: 20.0 gal (FURNISHED BY COTR)
TEST VOLUME RANGE: 18.4 gal TO 18.8 gal (92-94% OF USABLE)
ACTUAL TEST VOLUME: 18.6 gal (WITH ENTIRE FUEL SYSTEM FILLED)
TEST FLUID TYPE: STODDARD SOLVENT
SPECIFIC GRAVITY: 0.764
KINEMATIC VISCOSITY: 0.99 centistokes
TEST FLUID COLOR: PURPLE

DETAILS OF FUEL SYSTEM: The fuel tank is located in front of the rear
axle. The fuel filler neck is located on the left side and entered
the left rear corner of the tank. The fuel lines ran along the left
side to the front.

ELECTRIC FUEL PUMP: Yes

FUEL INJECTION: Yes

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT
OPERATING? No

TABLE 11 FMVSS 301 POST-IMPACT TEST DATA

NHTSA NO.: CRO100
TEST DATE: 01/31/94
VEHICLE YEAR/MAKE/
MODEL/BODY STYLE: 1994/Cadillac/Concours/4-door sedan

TEST REQUIREMENTS:

Test vehicle fuel tank filled to 92 to 94% of manufacturer's usable capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:

 X FRONTAL (30 mph)
 OBLIQUE (30 mph) WITH ° BARRIER FACE
FIRST CONTACTING (DRIVER/PASS.) SIDE.
 REAR MOVING BARRIER (30 mph)
 LATERAL MOVING BARRIER (20 mph)

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

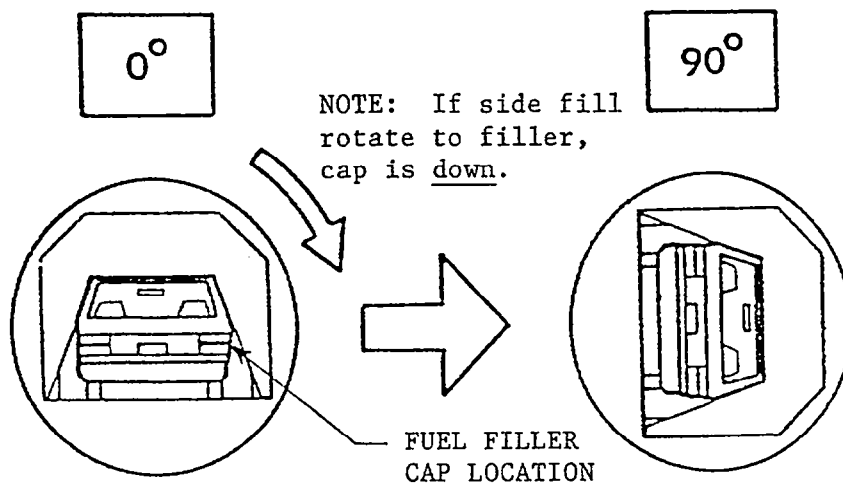
	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FROM IMPACT UNTIL VEHICLE MOTION CEASES	0 oz	1 oz
2. 5-MINUTE PERIOD AFTER VEHICLE MOTION CEASES	0 oz	5 oz
3. NEXT 25 MINUTES AFTER 5 MINUTE PERIOD	0 oz	1 oz/1 min

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: CR0100
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - = 7 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

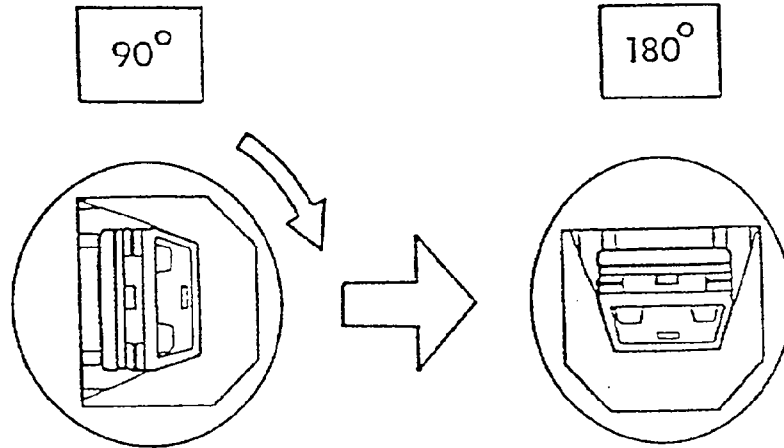
<u>0° TO 90° ROTATION (FUEL FILLER CAP DOWN)</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz	5 oz
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz	1 oz
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz	1 oz

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CRO100
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - = 14 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

90° TO 180° ROTATION

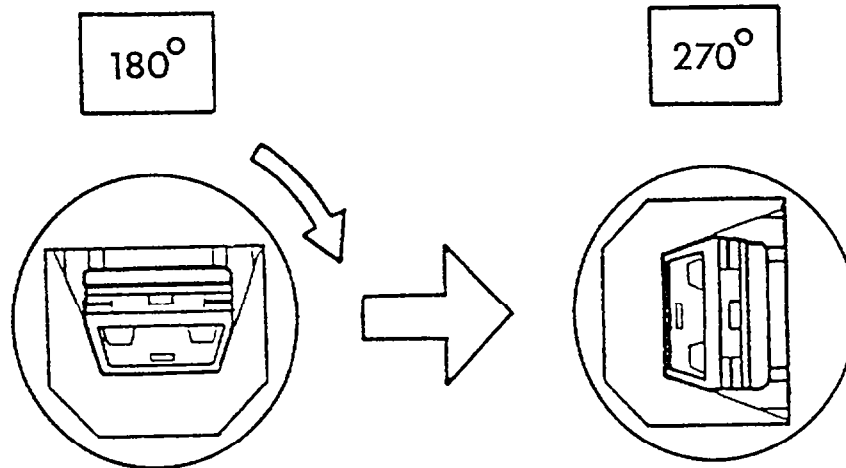
	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz	5 oz
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz	1 oz
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz	1 oz

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CR0100
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - = 21 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

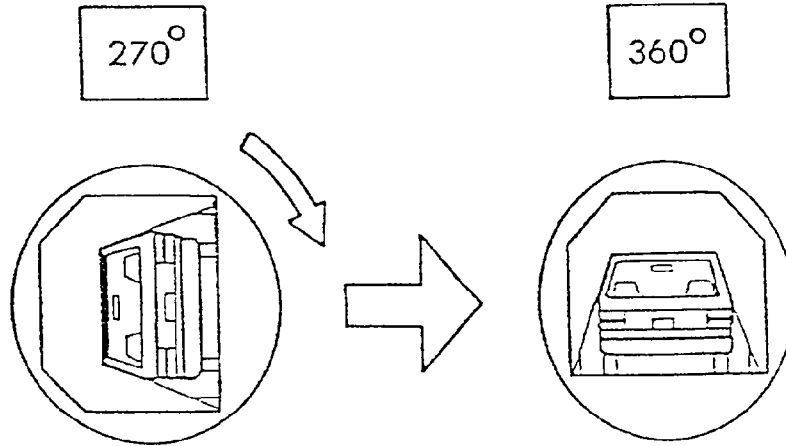
<u>180° TO 270° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz	5 oz
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz	1 oz
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz	1 oz

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CR0100
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds
FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds
TOTAL - - - - - = 7 minutes, 00 seconds
NEXT WHOLE MINUTE INTERVAL - - - - = 28 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

<u>270° TO 360° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz	5 oz
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz	1 oz
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz	1 oz

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

SECTION 4.0

VEHICLE, OCCUPANT, AND CAMERA MEASUREMENTS

FIGURE 7 PRE-TEST AND POST-TEST MEASUREMENT POINTS

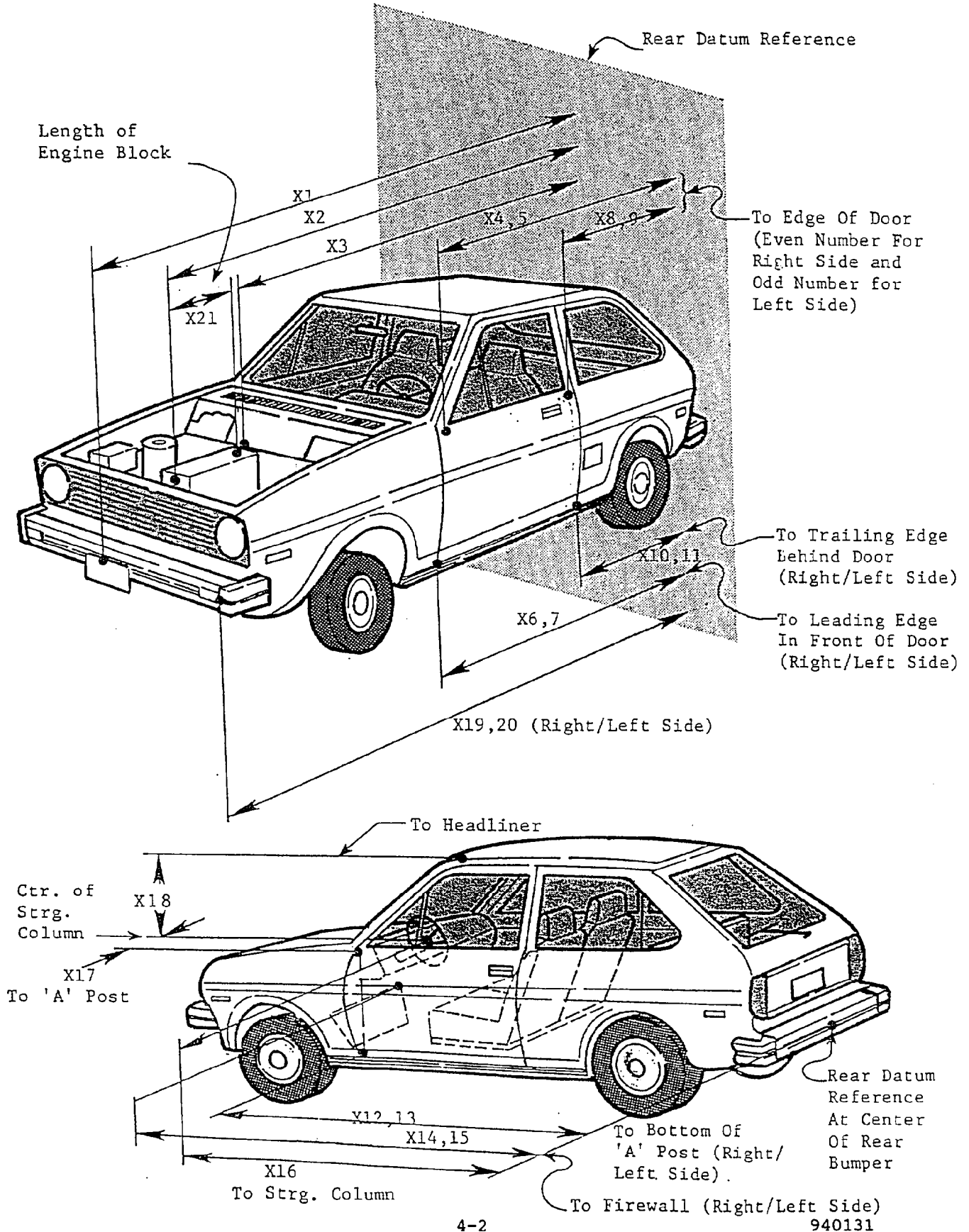
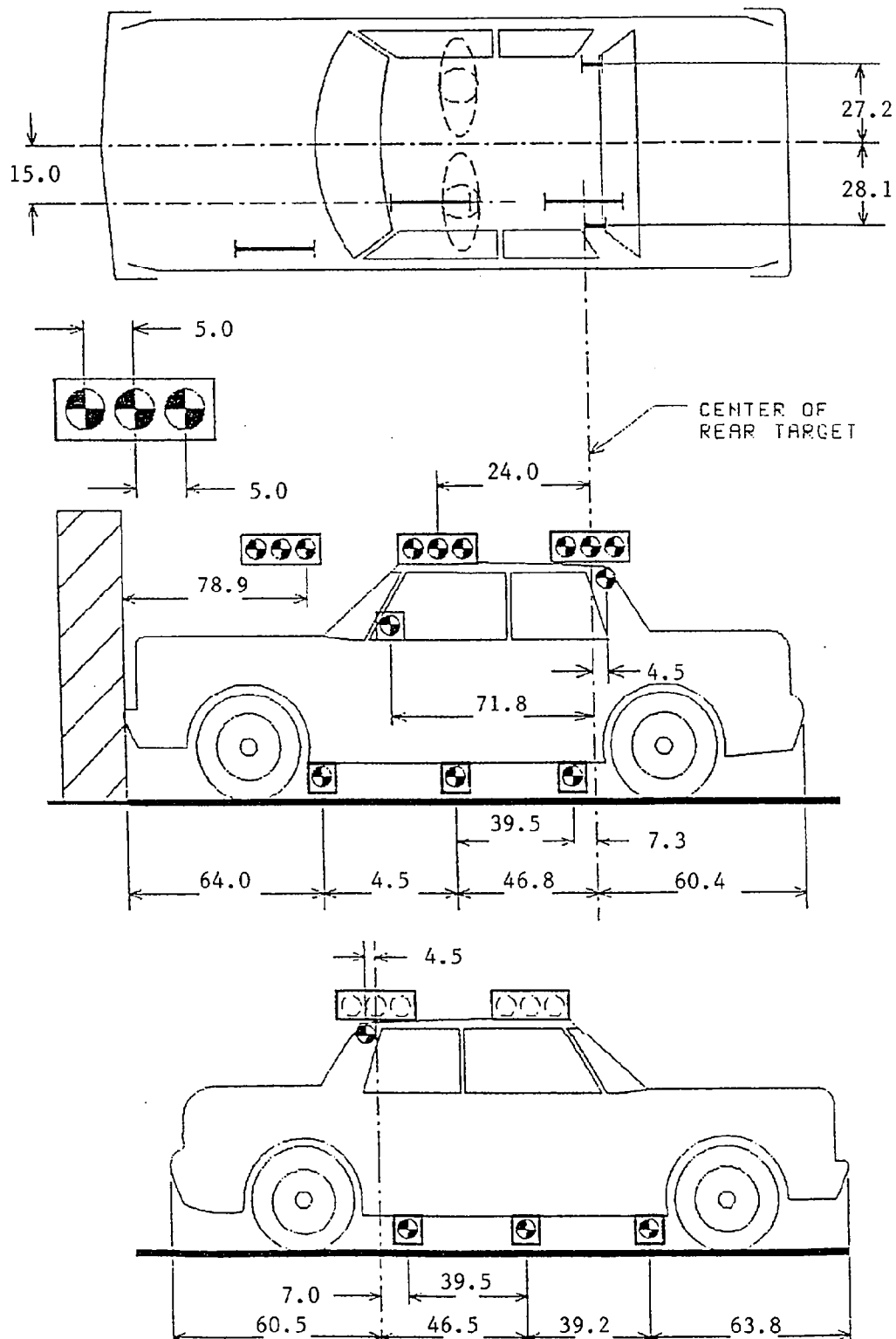


TABLE 12 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Cadillac/Concours TEST NUMBER: 940131

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFFERENCE
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	210.0 in	186.6 in	23.4 in
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	182.8 in	174.2 in	8.6 in
X3	REAR SURFACE OF VEHICLE TO FIREWALL	156.0 in	153.9 in	2.1 in
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	143.2 in	142.2 in	1.0 in
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	143.4 in	143.0 in	0.4 in
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	142.0 in	142.2 in	-0.2 in
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	142.1 in	142.1 in	0.0 in
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	98.8 in	98.6 in	0.2 in
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	98.1 in	98.6 in	-0.5 in
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	98.1 in	98.1 in	0.0 in
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	98.6 in	99.5 in	-0.9 in
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	142.4 in	143.6 in	-1.2 in
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	142.3 in	142.1 in	0.2 in
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	154.0 in	154.0 in	0.0 in
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	153.6 in	152.8 in	0.8 in
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	123.8 in	120.1 in	3.7 in
X17	CENTER OF STEERING COLUMN TO "A" POST	13.1 in	12.2 in	0.9 in
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.2 in	15.2 in	3.0 in
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	202.0 in	185.5 in	16.5 in
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	201.6 in	186.2 in	15.4 in
X21	LENGTH OF ENGINE BLOCK	20.2 in	20.2 in	0.0 in

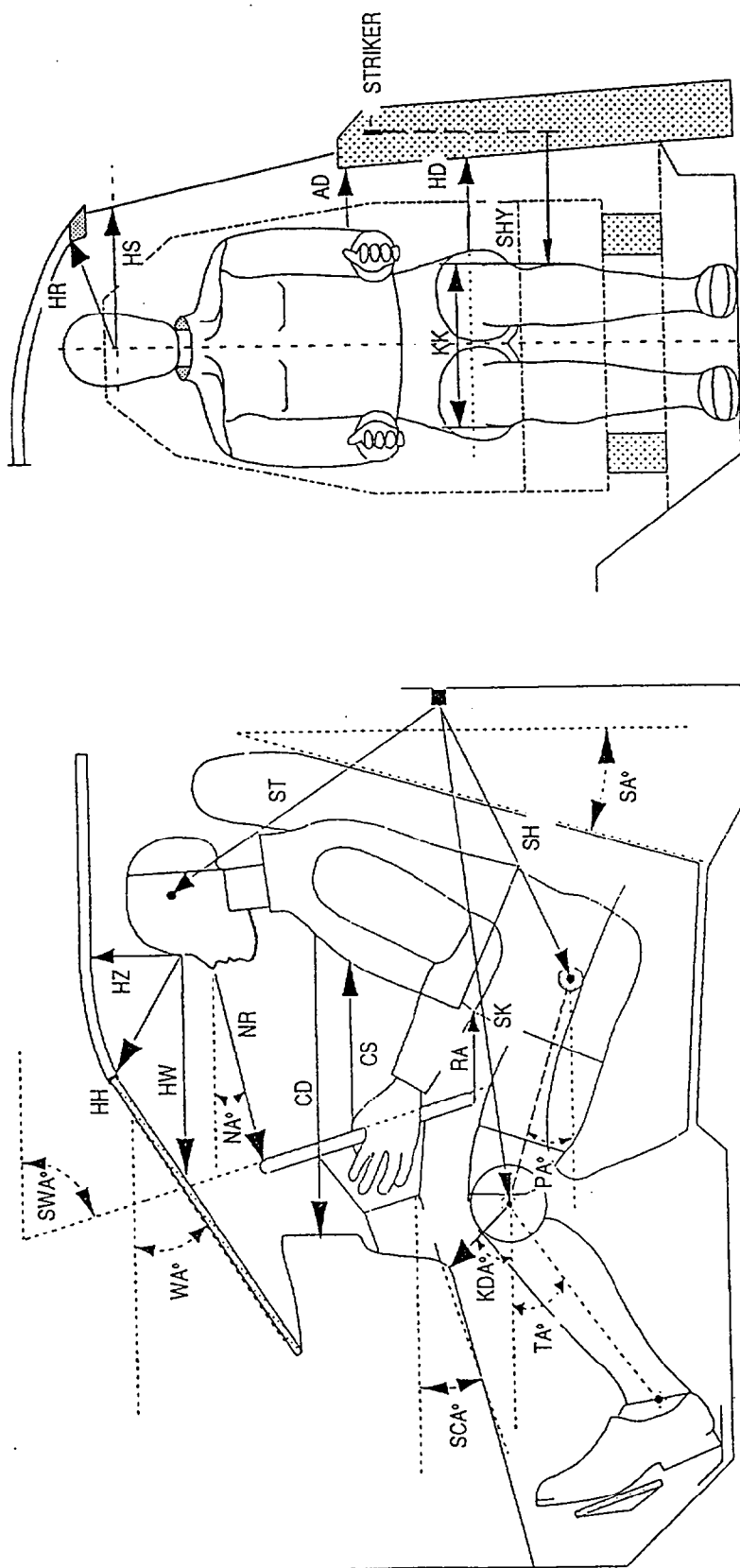
FIGURE 8 VEHICLE TARGET LOCATIONS



All measurements are in inches.

FIGURE 9

DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS



VERTICAL TRANSVERSE PLANE

VERTICAL LONGITUDINAL PLANE

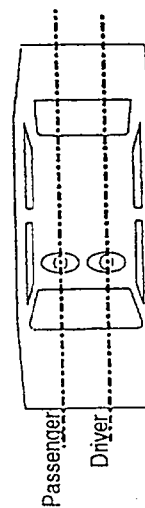
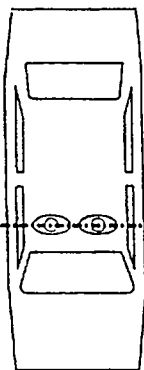


TABLE 13 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #230)	PASSENGER (SERIAL #314)
WA	WINDSHIELD ANGLE	30°	NA
SWA	STEERING WHEEL ANGLE	70°	NA
SCA	STEERING COLUMN ANGLE	18°	NA
SA	SEAT BACK ANGLE	26°	26°
HZ	HEAD TO ROOF	8.1 in	8.1 in
HH	HEAD TO HEADER	14.5 in	13.1 in
HW	HEAD TO WINDSHIELD	24.2 in	22.7 in
HR	HEAD TO SIDE HEADER	10.6 in	10.9 in
NR	NOSE TO RIM	14.9 in	NA
NA	NOSE TO RIM ANGLE	8°	NA
CD	CHEST TO DASH	20.8 in	20.7 in
CS	STEERING WHEEL TO CHEST	10.9 in	NA
RA	RIM TO ABDOMEN	7.5 in	NA
KDL	LEFT KNEE TO DASH	6.8 in	7.2 in
KDR	RIGHT KNEE TO DASH	7.4 in	6.4 in
KDA	OUTBOARD KNEE TO DASH ANGLE	43°	40°
PA	PELVIC ANGLE	24°	22°
TA	TIBIAL ANGLE	30°	30°
KK	KNEE TO KNEE	11.8 in	10.5 in
ST	STRIKER TO HEAD	20.2 in	20.6 in
	STRIKER TO HEAD ANGLE	-79°	-76°
SK	STRIKER TO KNEE	24.1 in	25.2 in
	STRIKER TO KNEE ANGLE	3°	1°
SH	STRIKER TO H-POINT	11.8 in	13.9 in
	STRIKER TO H-POINT ANGLE	31°	27°
SHY	STRIKER TO H-POINT (Y DIR.)	11.2 in	11.1 in
HS	HEAD TO SIDE WINDOW	16.8 in	17.1 in
HD	H-POINT TO DOOR	7.2 in	7.2 in
AD	ARM TO DOOR	6.1 in	2.8 in

The seat back angle (SA°) is measured relative to vertical, all other angles are measured relative to horizontal.

FIGURE 10
CAMERA POSITIONS
11, 12, 13

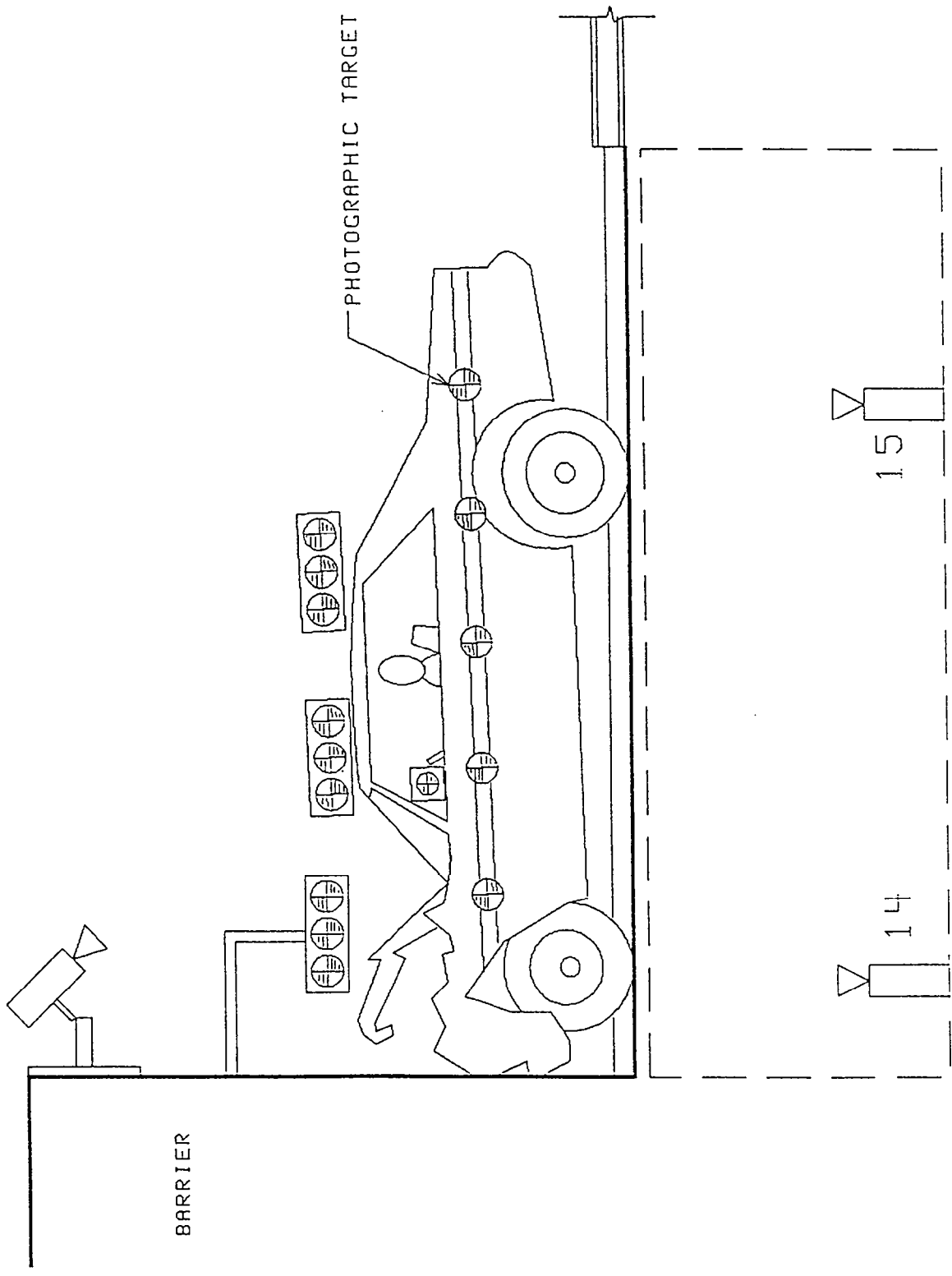


FIGURE 10
CAMERA POSITIONS, CONTINUED

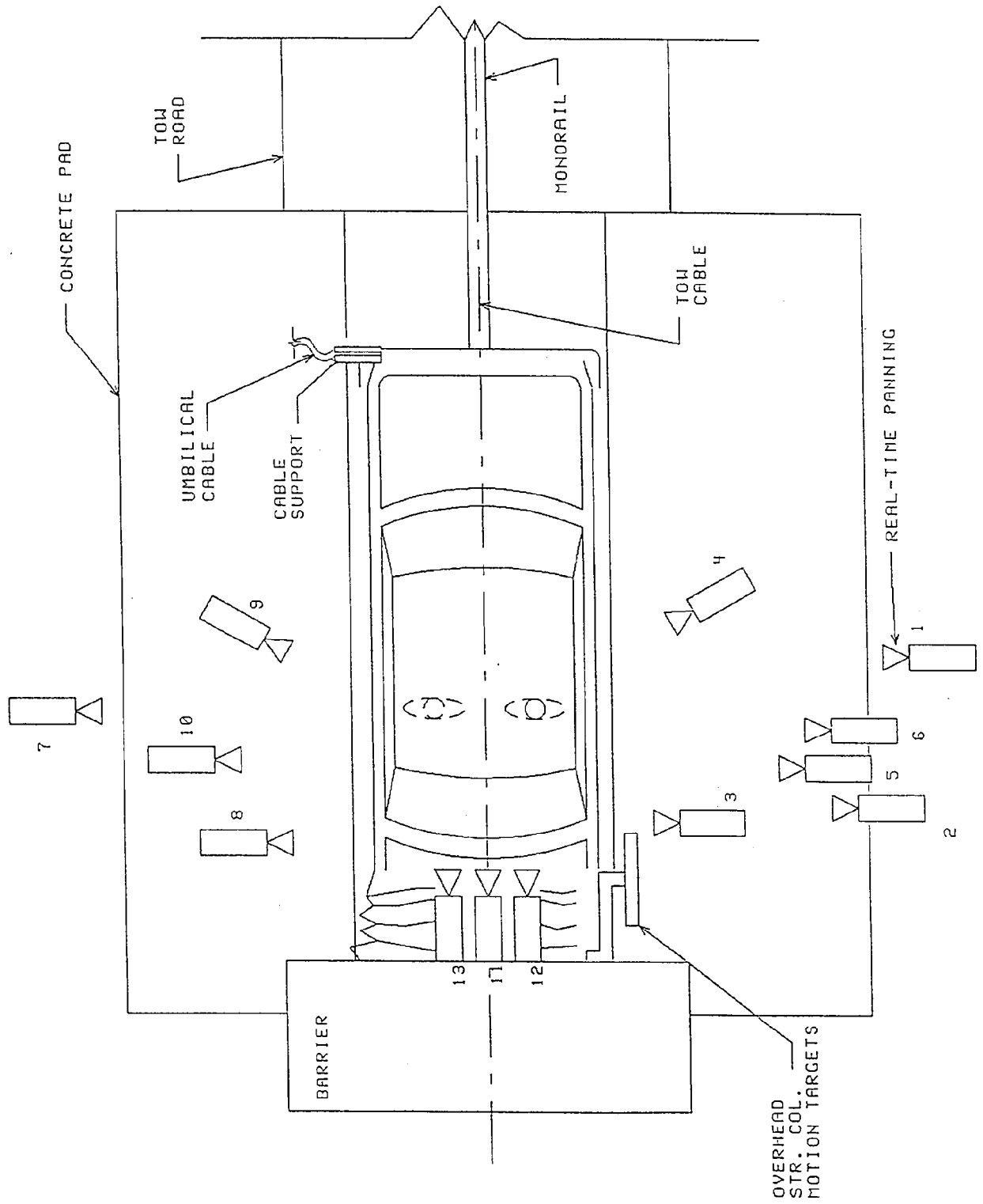


TABLE 14 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 940131 VEHICLE: 1994 Cadillac Concourse

CAMERA NO.	VIEW	CAMERA POSITIONS ¹			ANGLE ²	FILM PLANE TO HEAD		LENS	SPEED
		X	Y	Z		TARGET			
1	Real-time panning	-142.0 in	504.0 in	61.0 in	NA	NA		16 mm	24 frames/s
2	Left vehicle crush	-41.5 in	295.0 in	44.0 in	-4°	354.0 in		25 mm	995 frames/s
3	Left windshield intrusion	-53.0 in	309.4 in	42.3 in	0°	NA		50 mm	1005 frames/s
4	Driver kinematics	-157.3 in	116.0 in	87.0 in	-27°	98.0 in		25 mm	998 frames/s
5	Steering column motion	-96.0 in	286.0 in	103.0 in	-14°	NA		25 mm	1008 frames/s
6	Steering column motion	-96.0 in	286.0 in	75.1 in	-9°	NA		25 mm	1000 frames/s
7	Right overall	-81.3 in	-266.4 in	37.1 in	-2°	NA		13 mm	978 frames/s
8	Right windshield intrusion	-38.1 in	-306.1 in	44.0 in	0°	NA		50 mm	1000 frames/s
9	Passenger kinematics	-152.1 in	-116.0 in	87.0 in	-26°	87.0 in		25 mm	998 frames/s
10	Passenger kinematics	-38.8 in	-293.0 in	45.3 in	-4°	246.0 in		25 mm	998 frames/s
11	Windshield front view	-6.0 in	0.0 in	84.0 in	-40°	NA		13 mm	1018 frames/s
12	Driver - front view	-6.8 in	14.5 in	93.0 in	-50°	NA		17 mm	973 frames/s
13	Passenger - front view	-4.5 in	-13.8 in	93.0 in	-50°	NA		17 mm	1010 frames/s
14	Pit - front position	-50.5 in	0.0 in	-92.4 in	90°	NA		13 mm	1000 frames/s
15	Pit - rear position	-99.3 in	0.0 in	-99.0 in	90°	NA		13 mm	998 frames/s
16	Real-time documentation	NA	NA	NA	NA	NA		12-120 mm	24 frames/s

¹ +X: Film plane forward of barrier face

+Y: Film plane to left of monorail centerline

+Z: Film plane above ground level

² +Angle: Film plane angled upward from horizontal plane

APPENDIX A

PHOTOGRAPHS

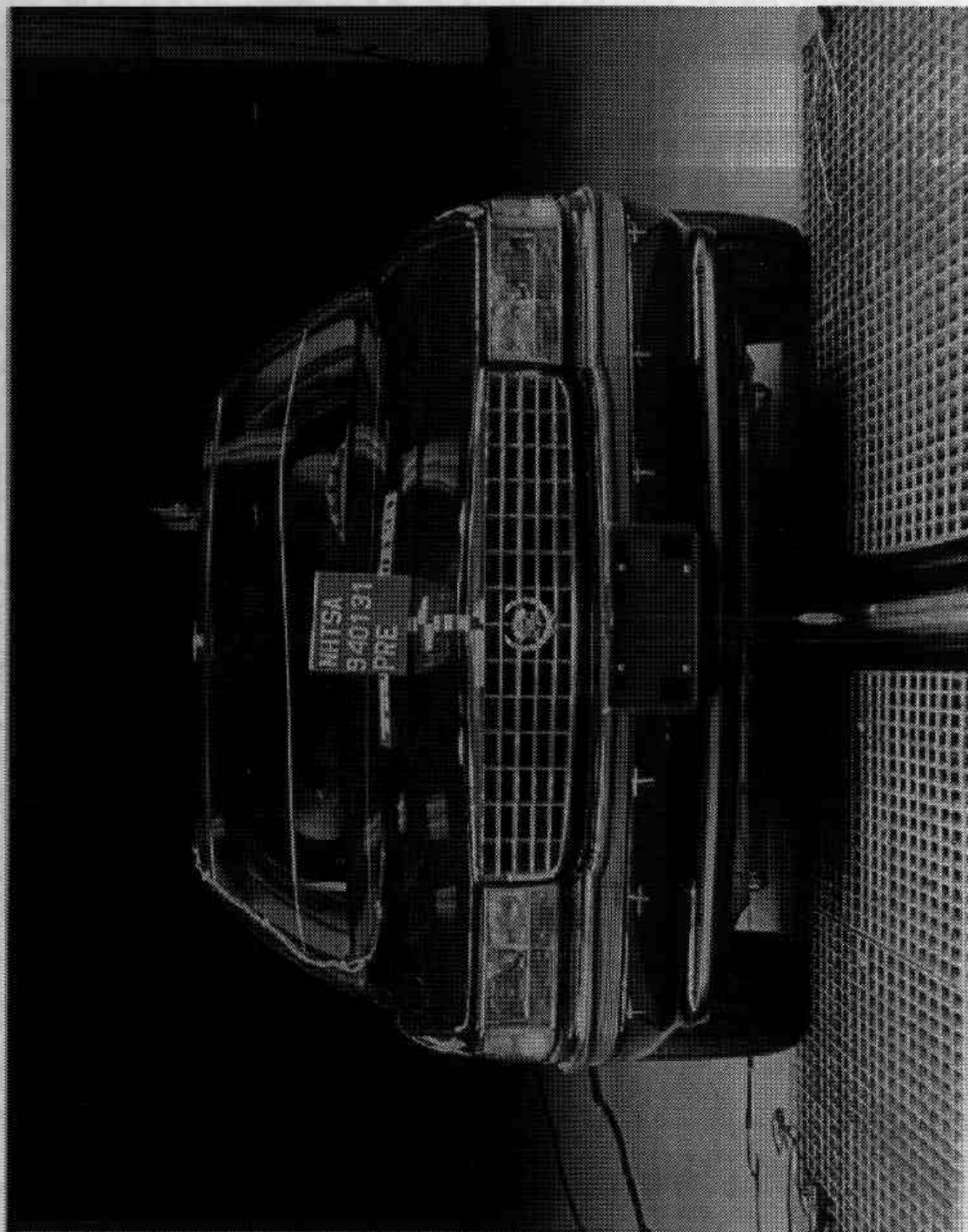


Figure A-1. PRE-TEST FRONT VIEW

A-2

940131

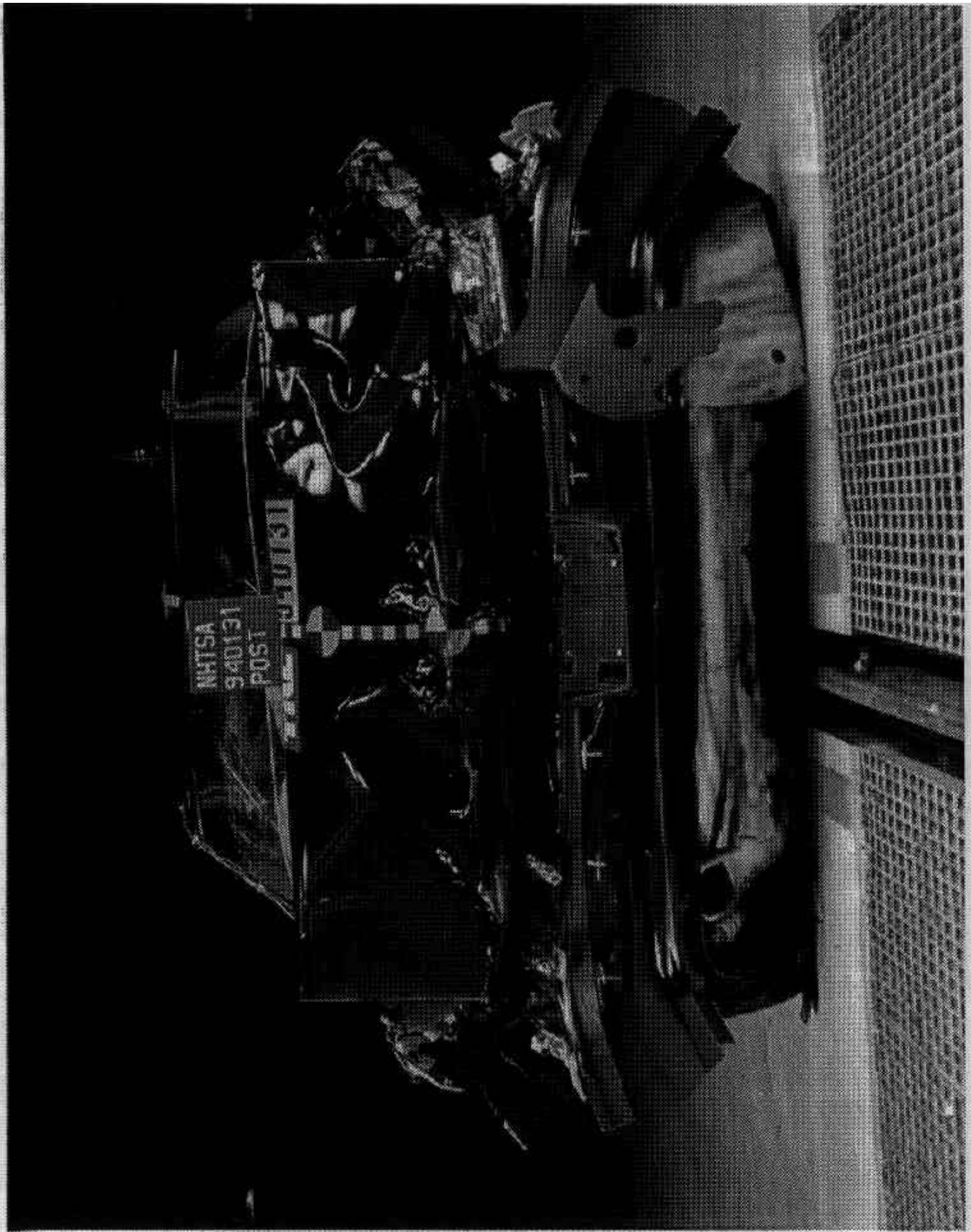


Figure A-2. POST-TEST FRONT VIEW

A-3

940131

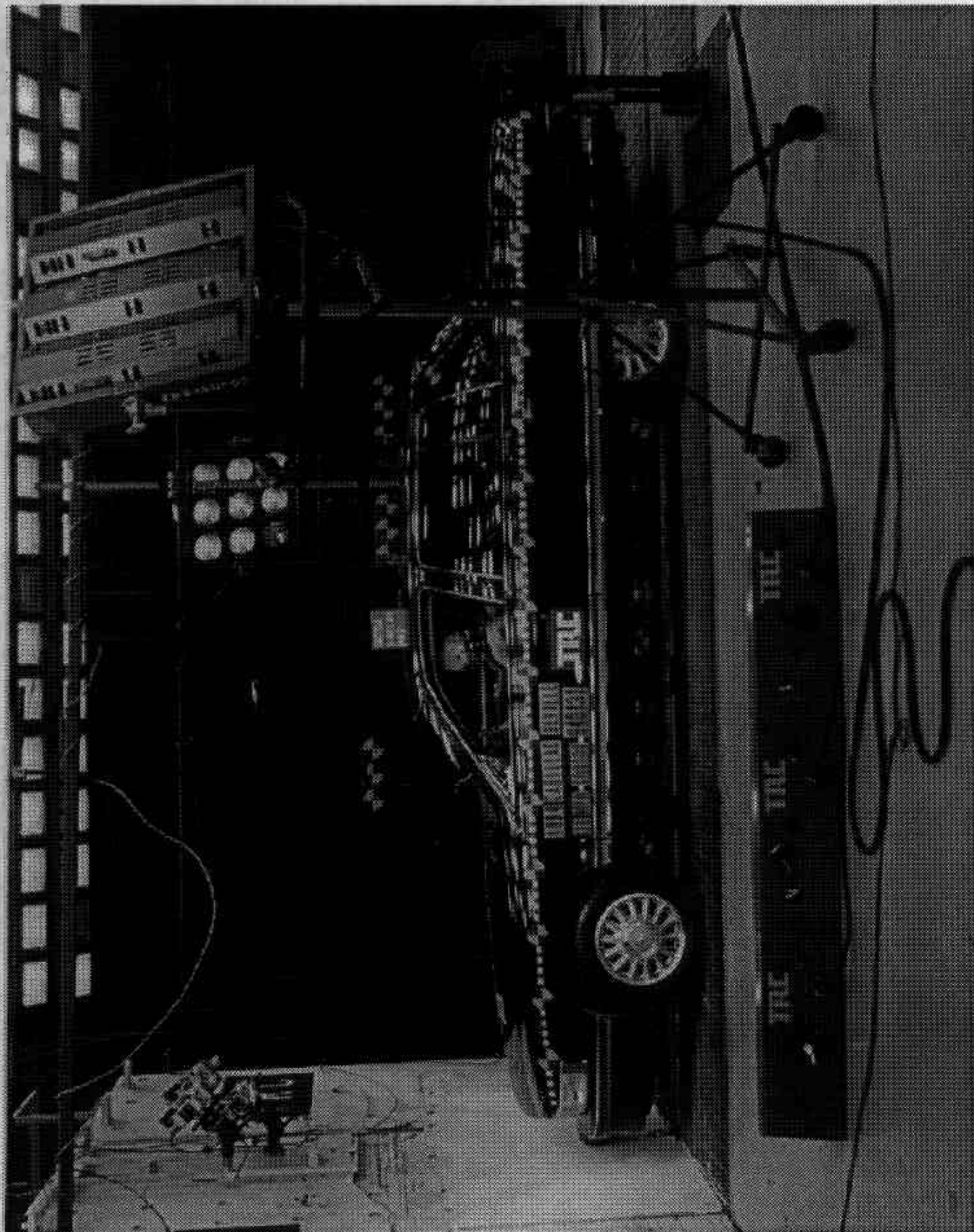


Figure A-3. PRE-TEST LEFT SIDE VIEW
A-4

940131

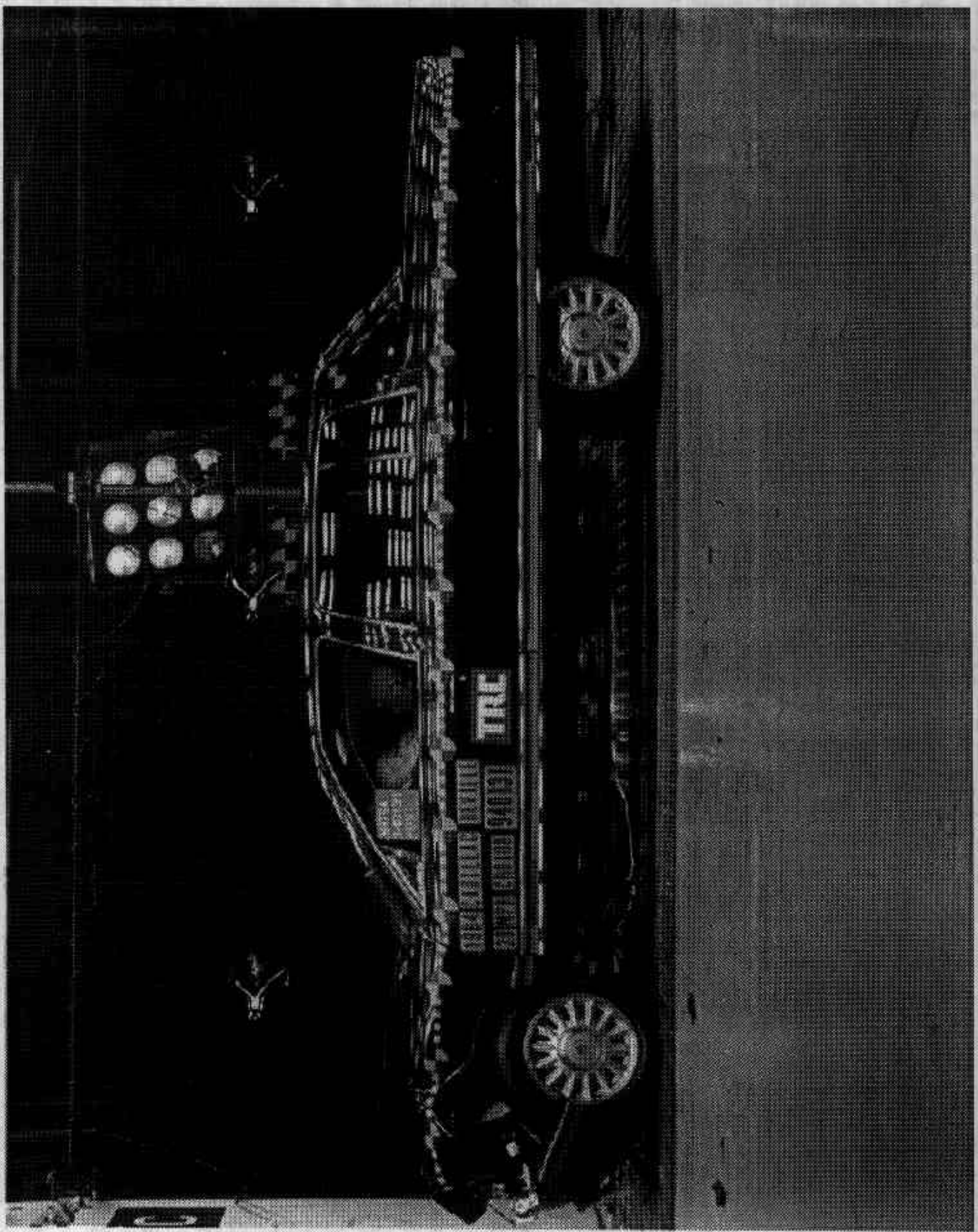


Figure A-4. POST-TEST LEFT SIDE VIEW

A-5

940131

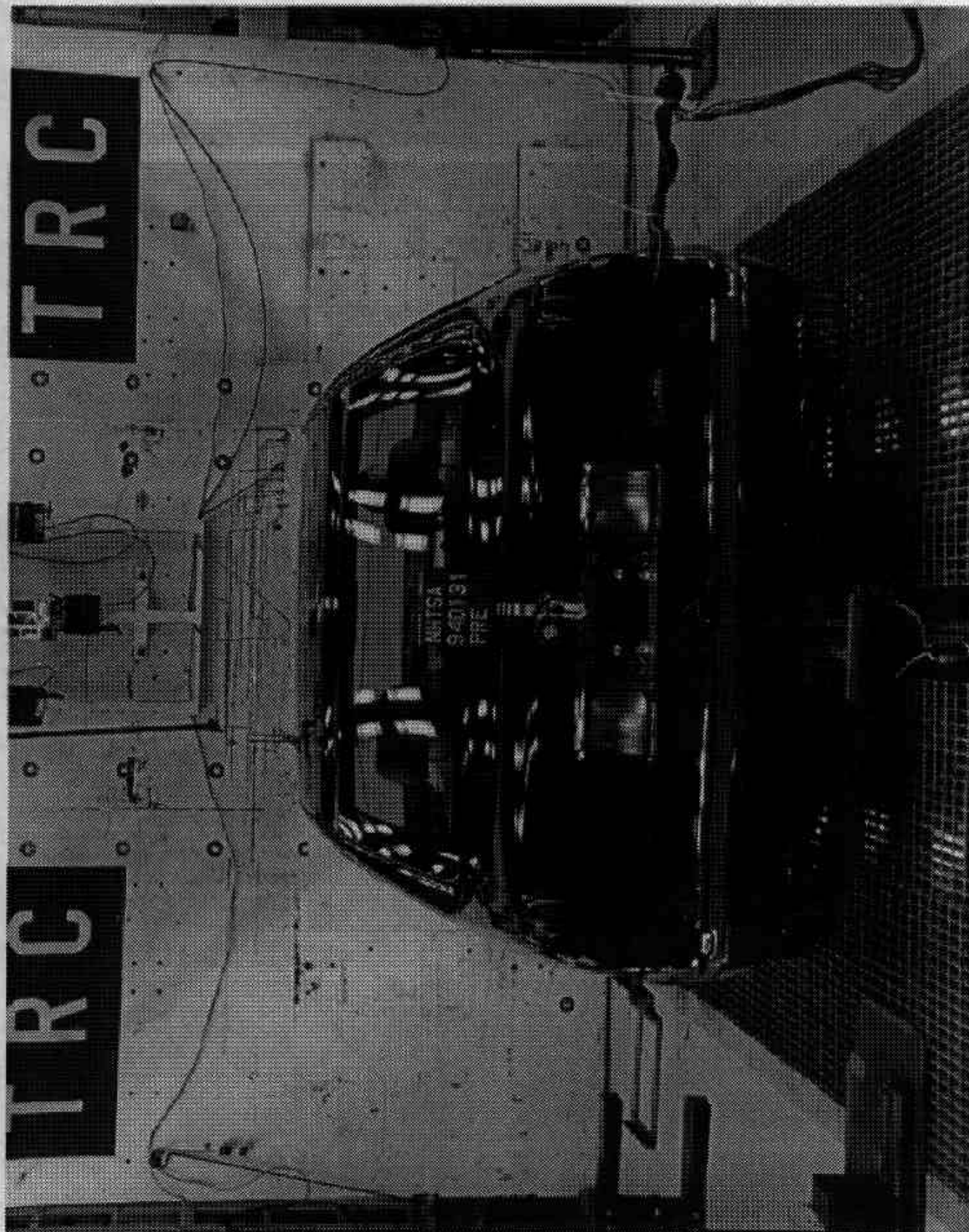


Figure A-5. PRE-TEST REAR VIEW

A-6

940131

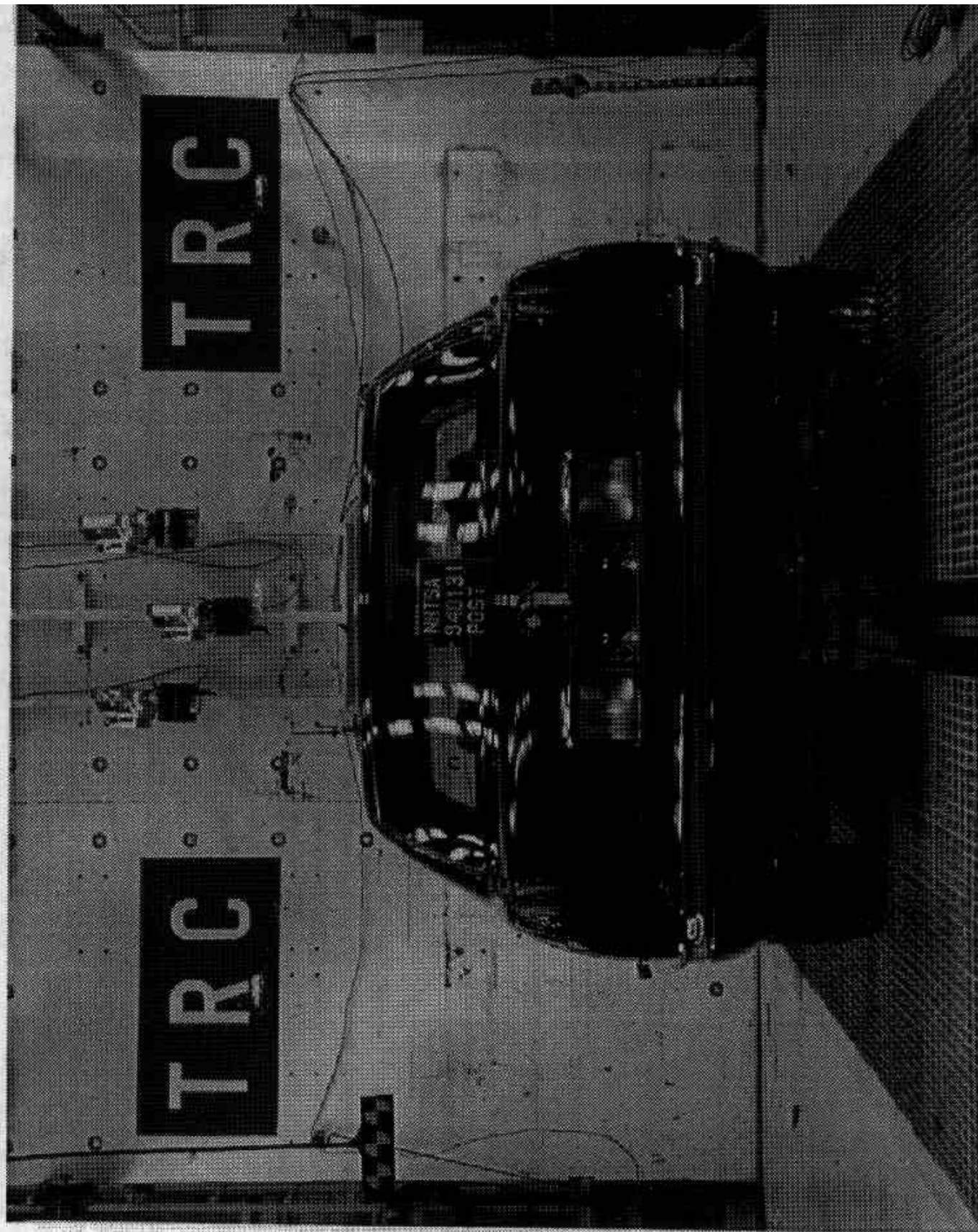


Figure A-6. POST-TEST REAR VIEW

A-7

940131

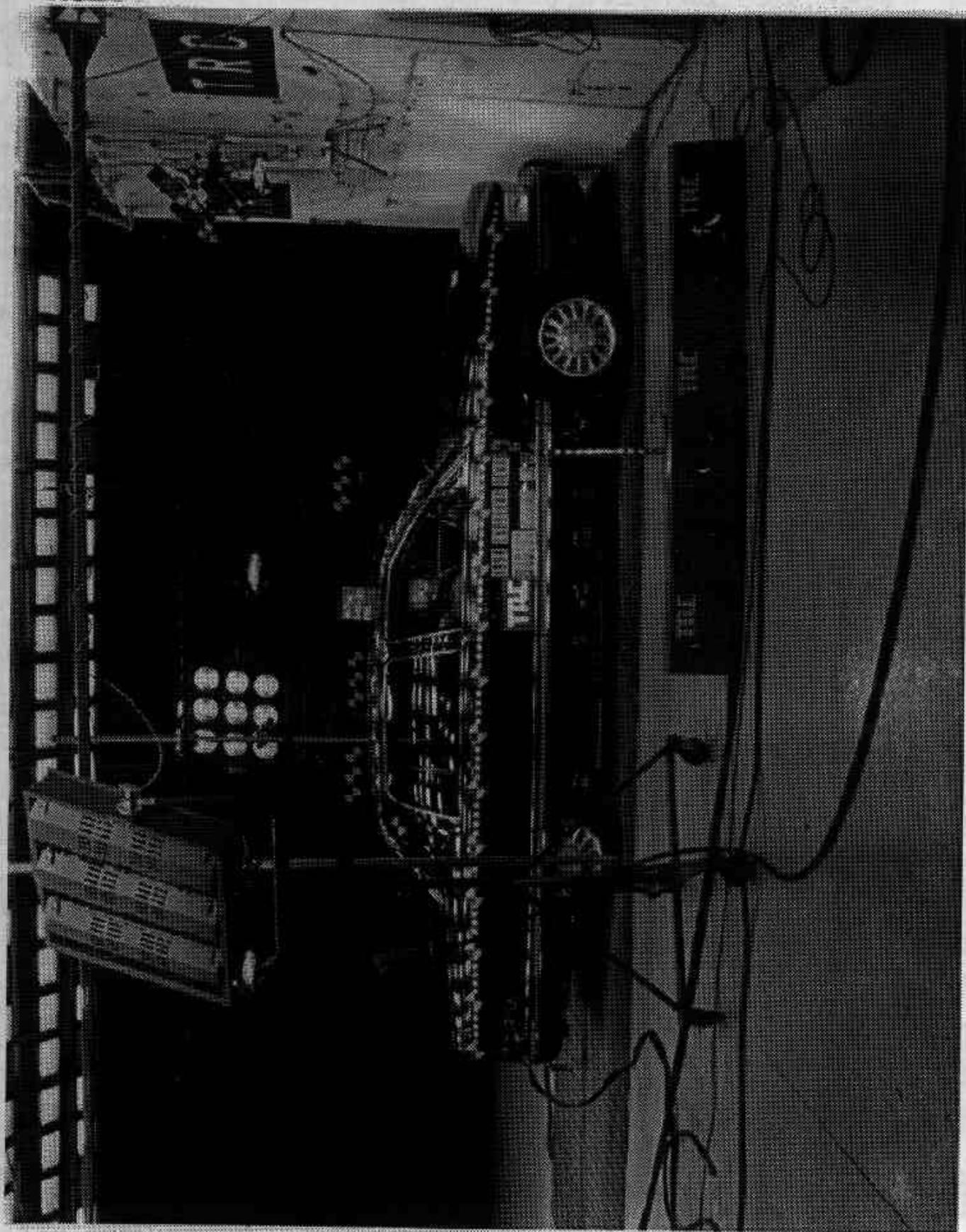


Figure A-7. PRE-TEST RIGHT SIDE VIEW

A-8

940131

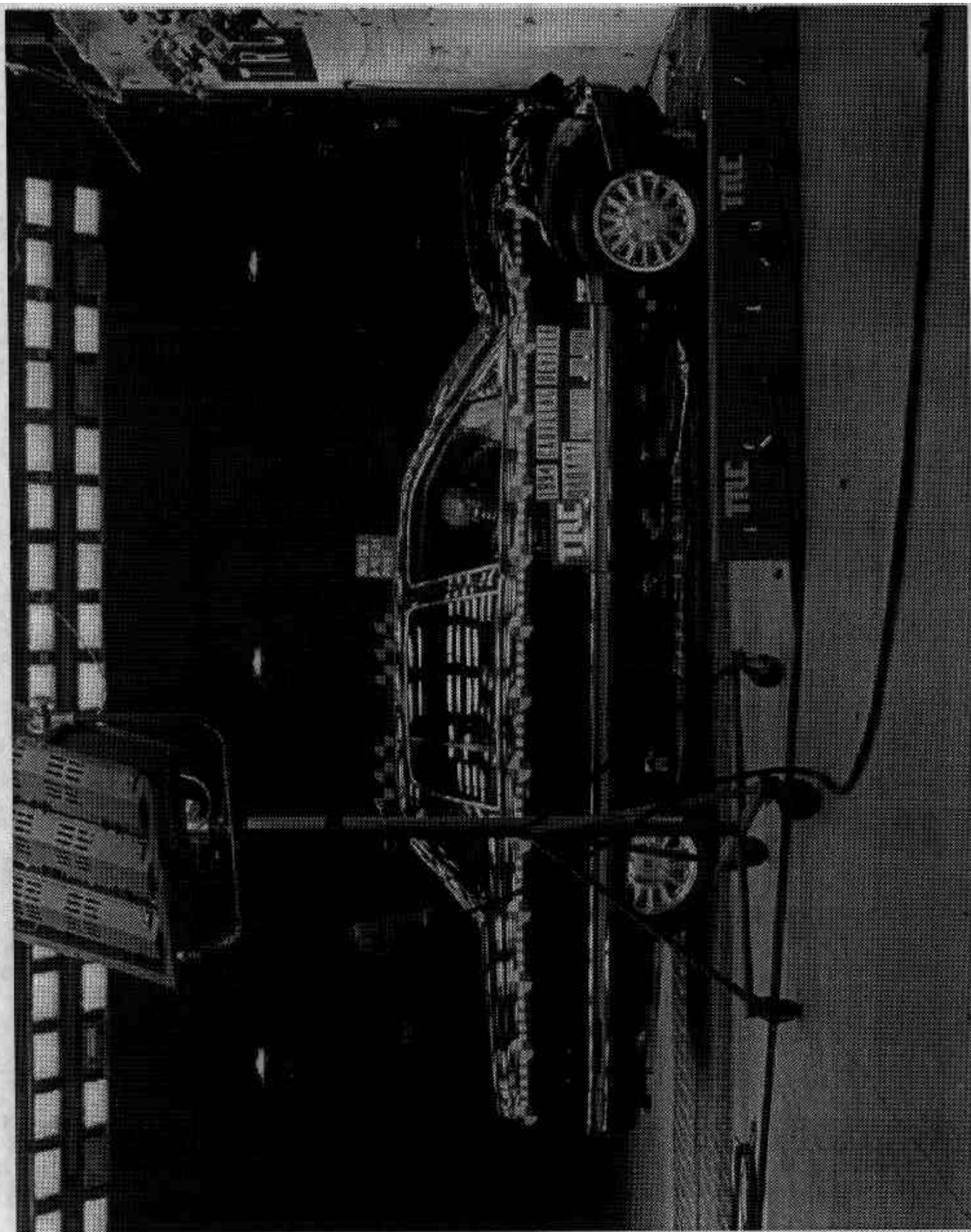


Figure A-8. POST-TEST RIGHT SIDE VIEW

A-9

940131

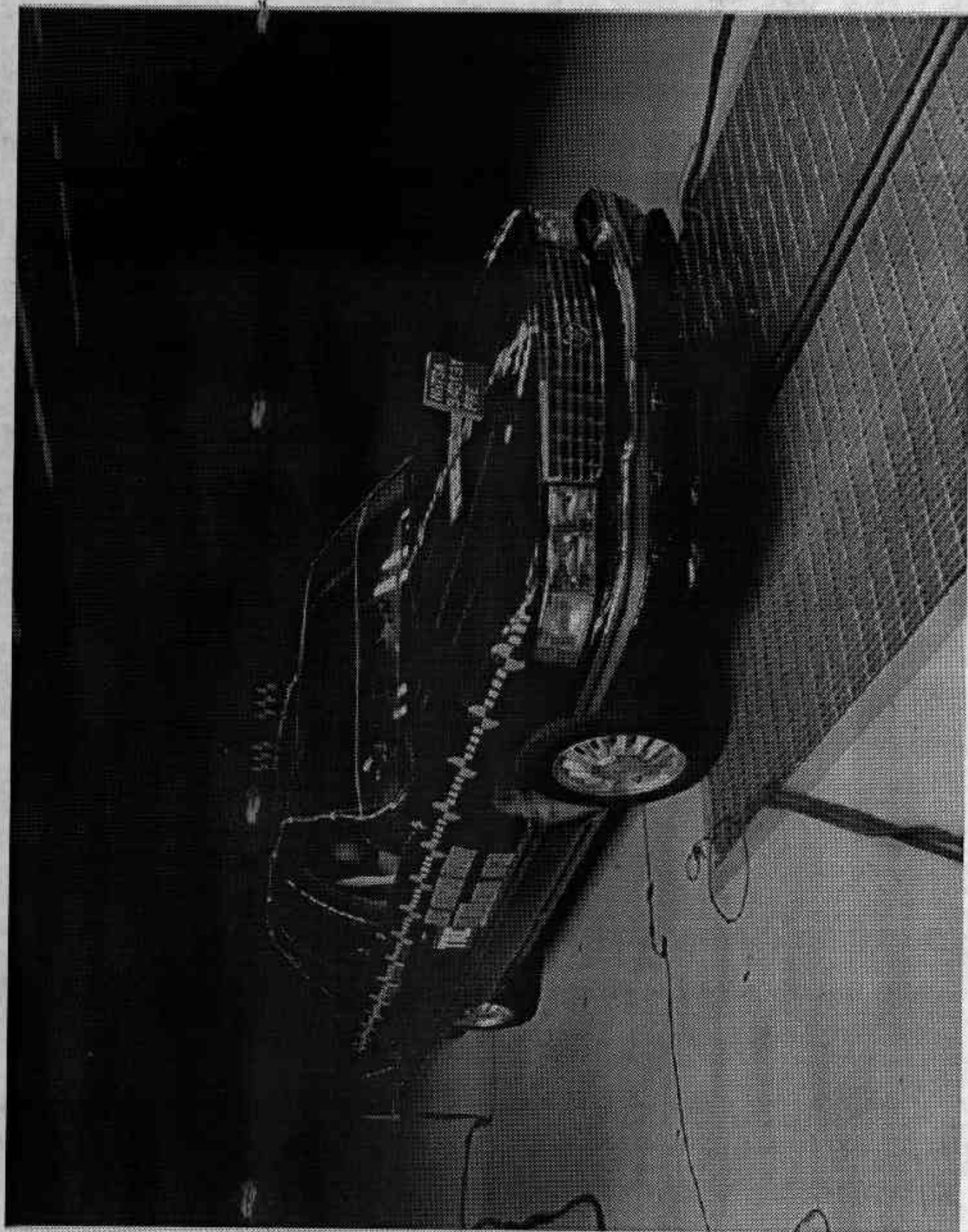


Figure A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

940131

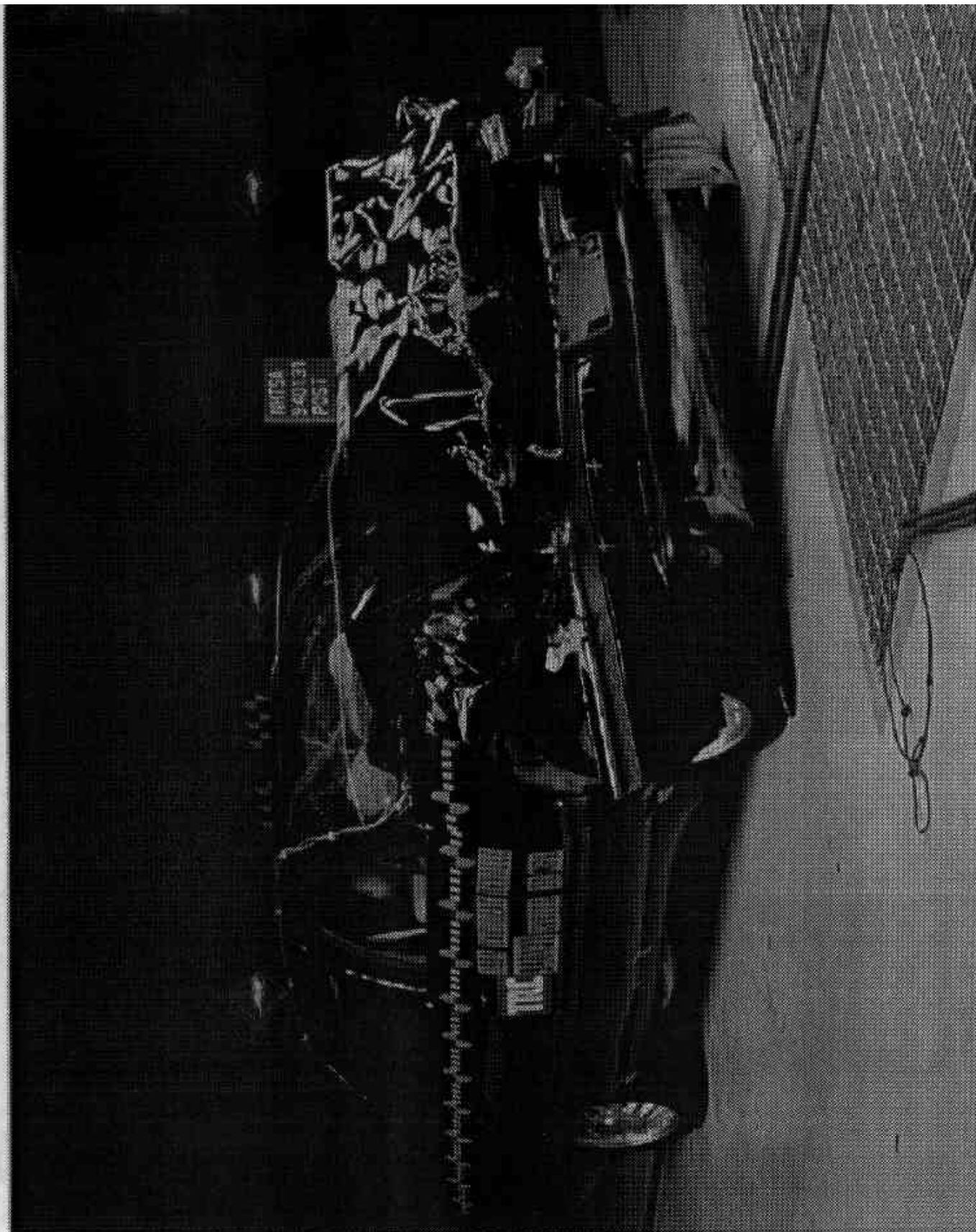


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

940131

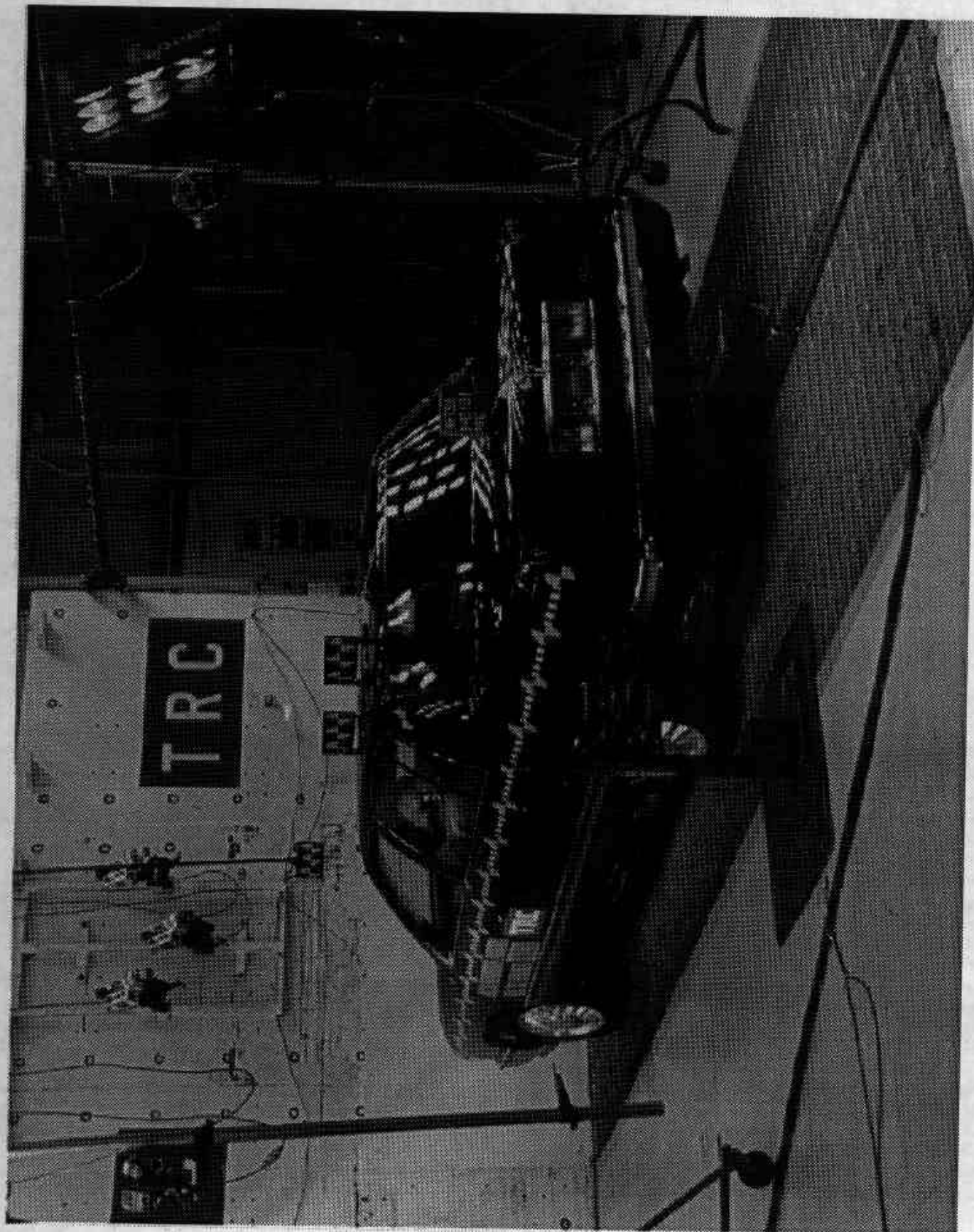


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

940131

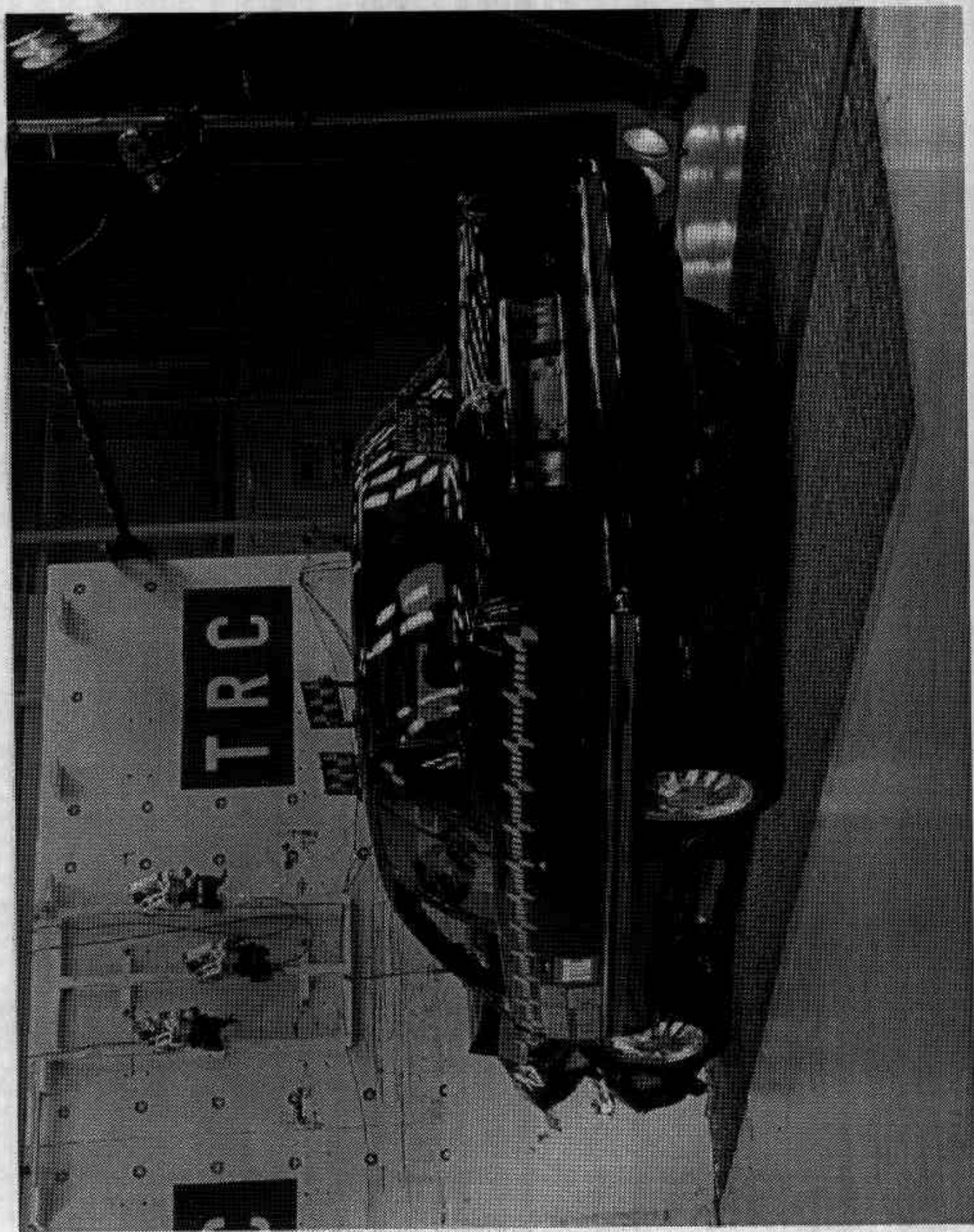


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

940131

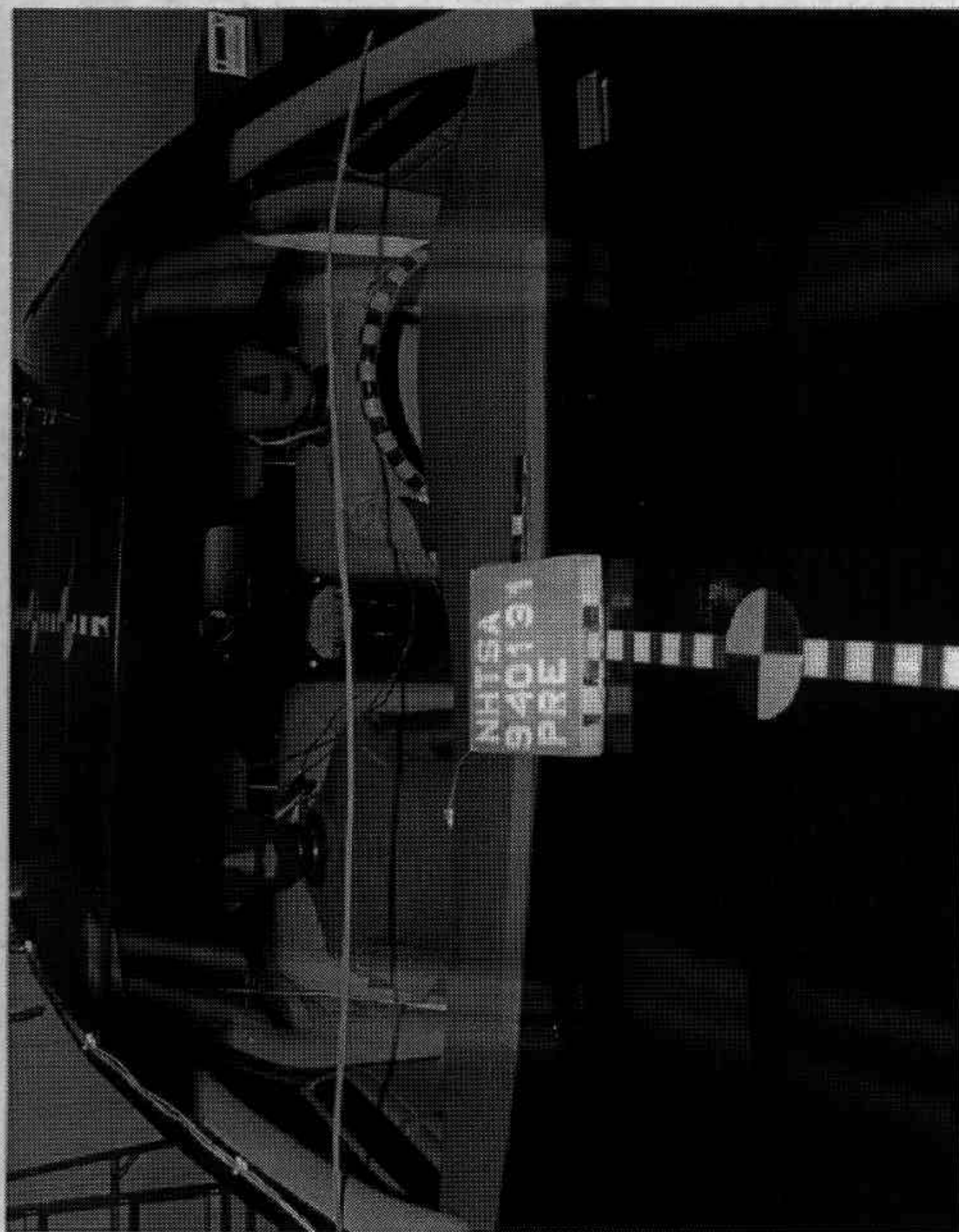


Figure A-13. PRE-TEST WINDSHIELD VIEW

A-14

940131

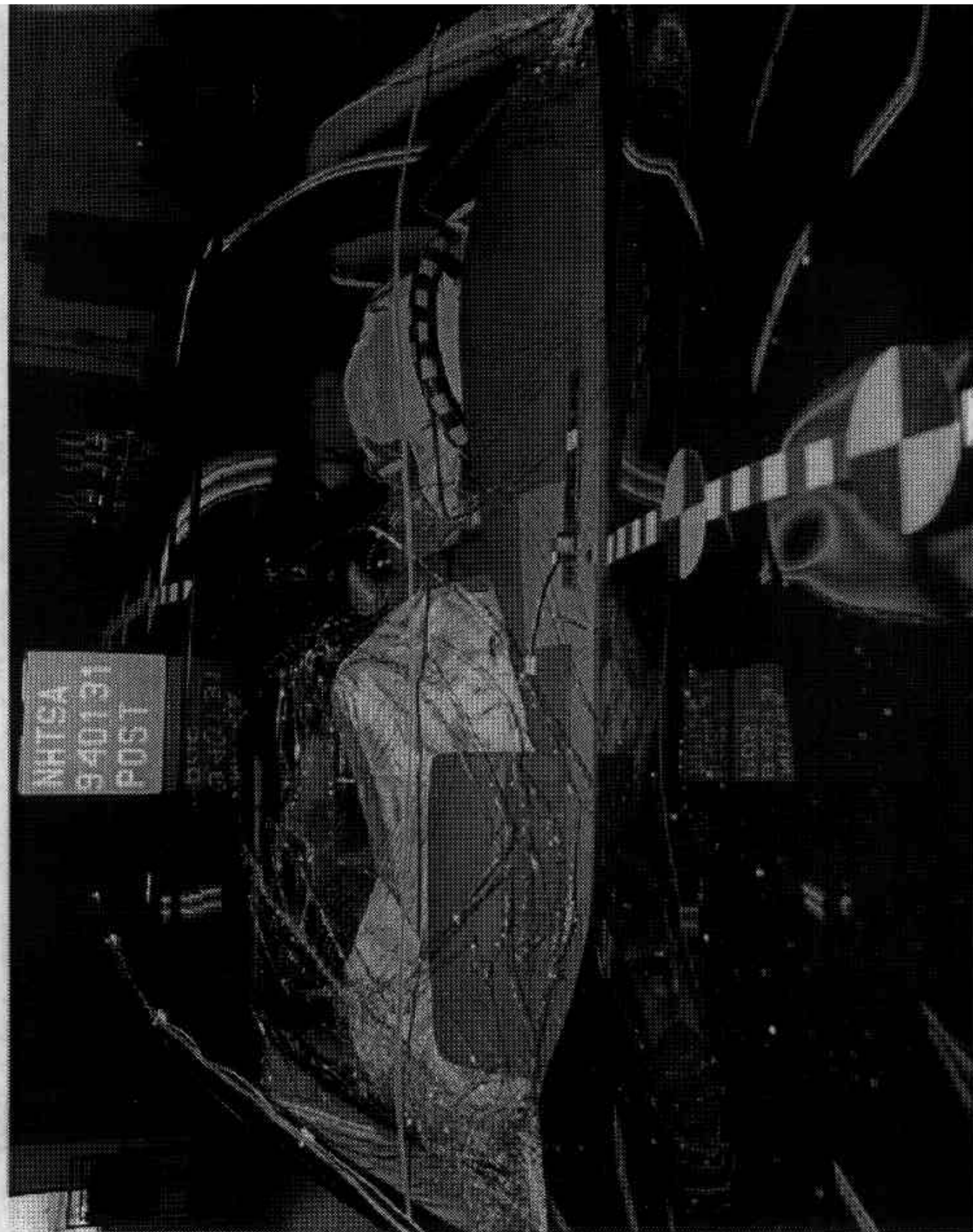


Figure A-14. POST-TEST WINDSHIELD VIEW
A-15

940131

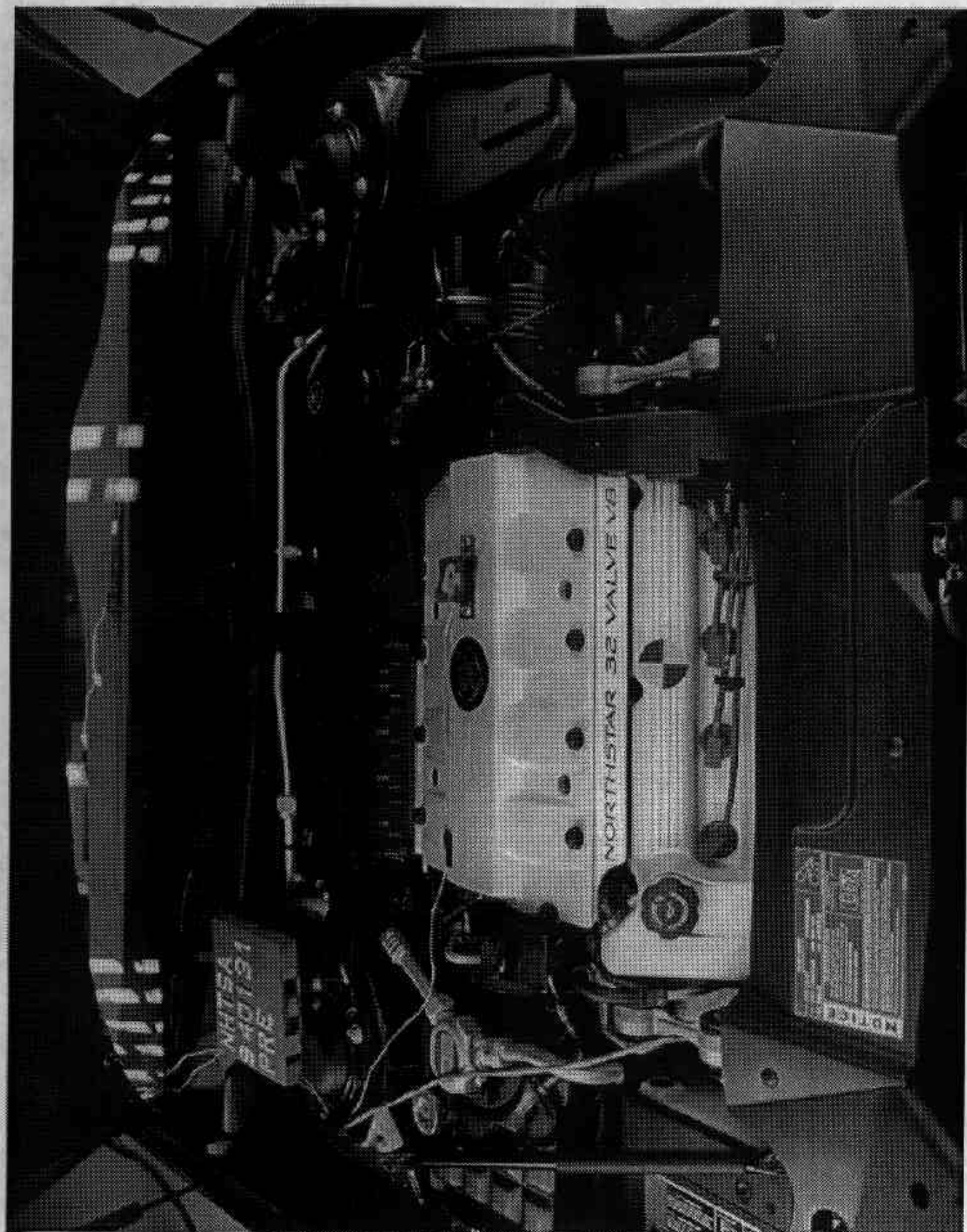


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

940131



Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW

A-17

940131



Figure A-17. PRE-TEST FUEL FILLER CAP VIEW
A-18

940131

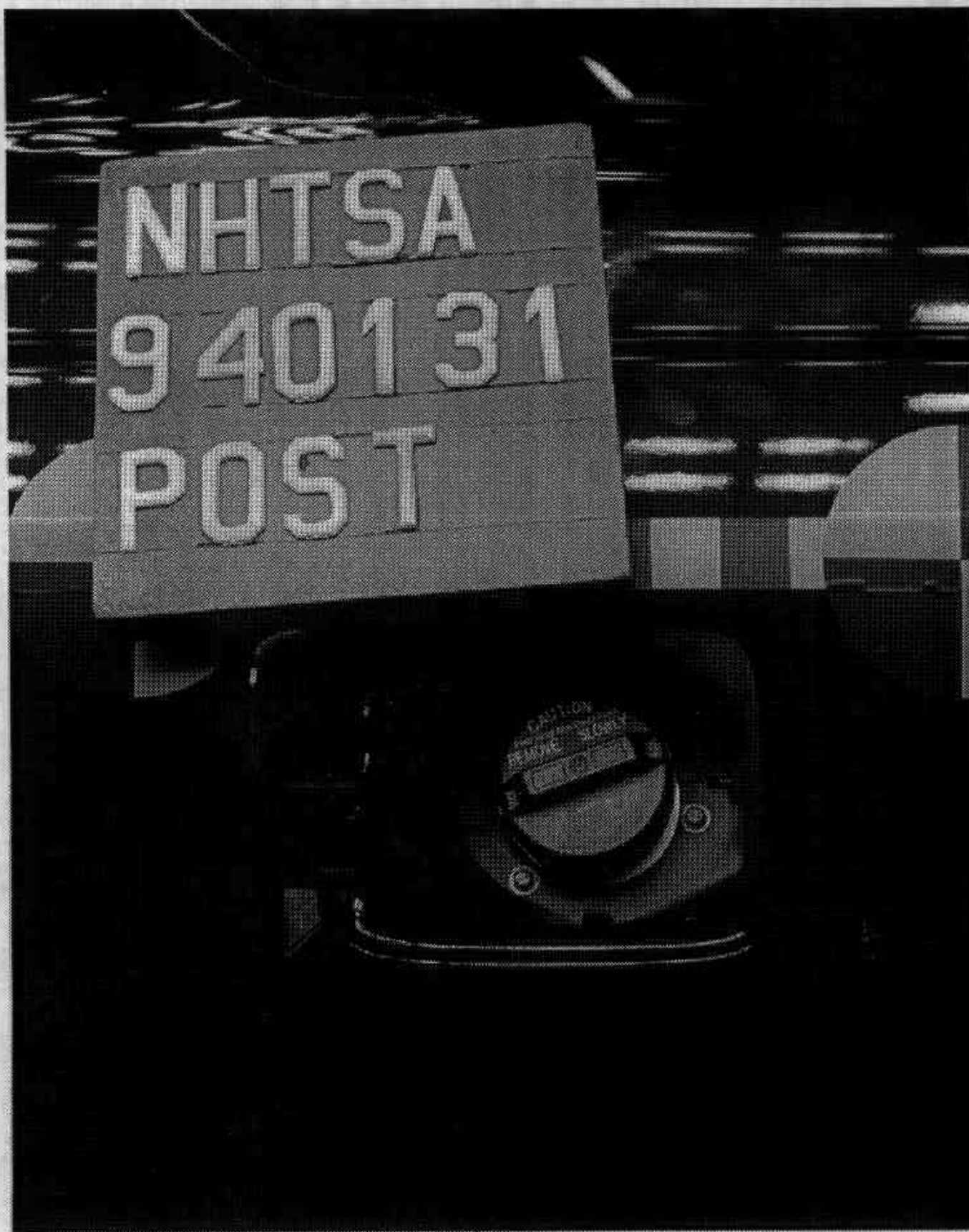


Figure A-18. POST-TEST FUEL FILLER CAP VIEW

A-19

940131

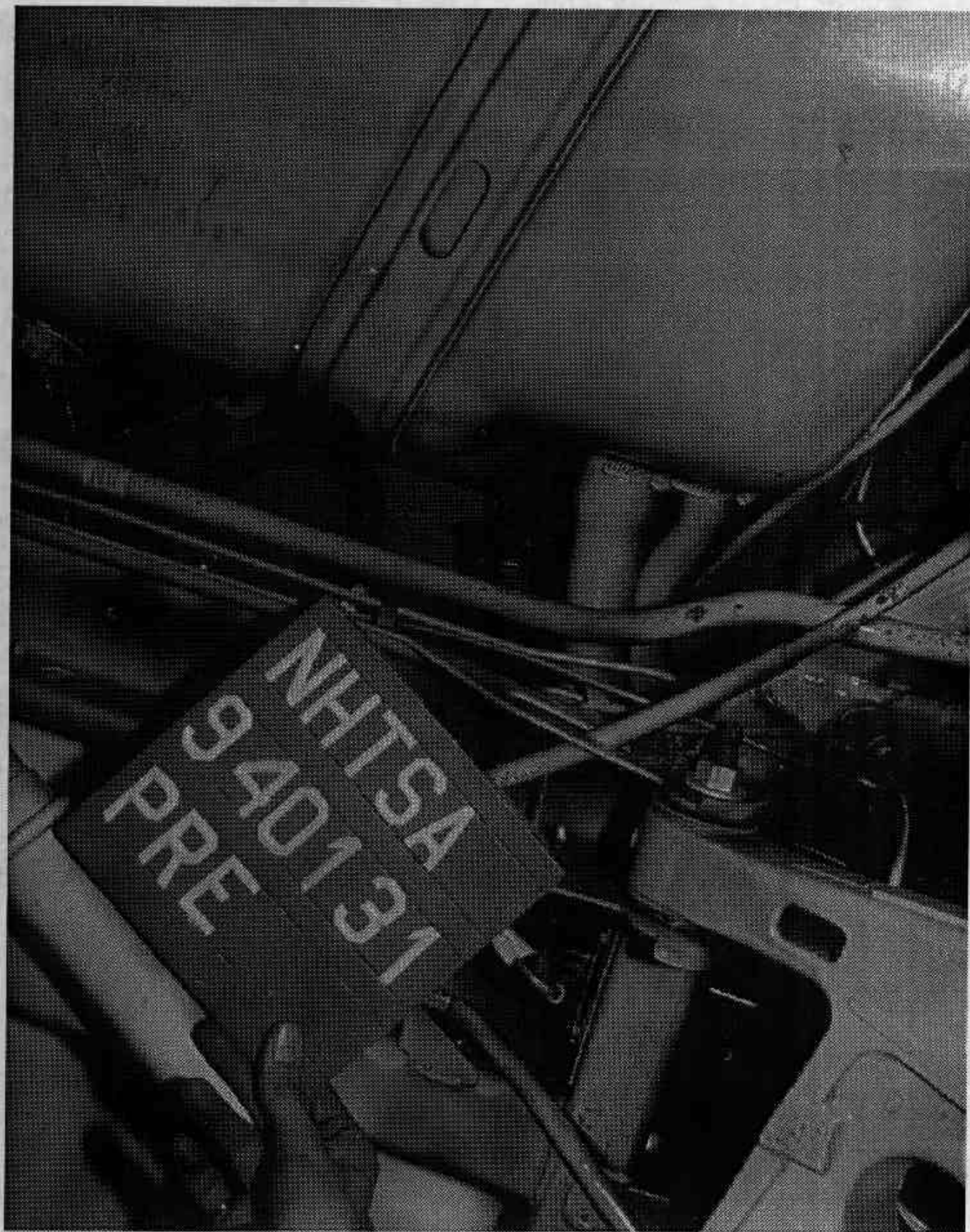


Figure A-19. PRE-TEST FUEL FILLER NECK VIEW
A-20

940131

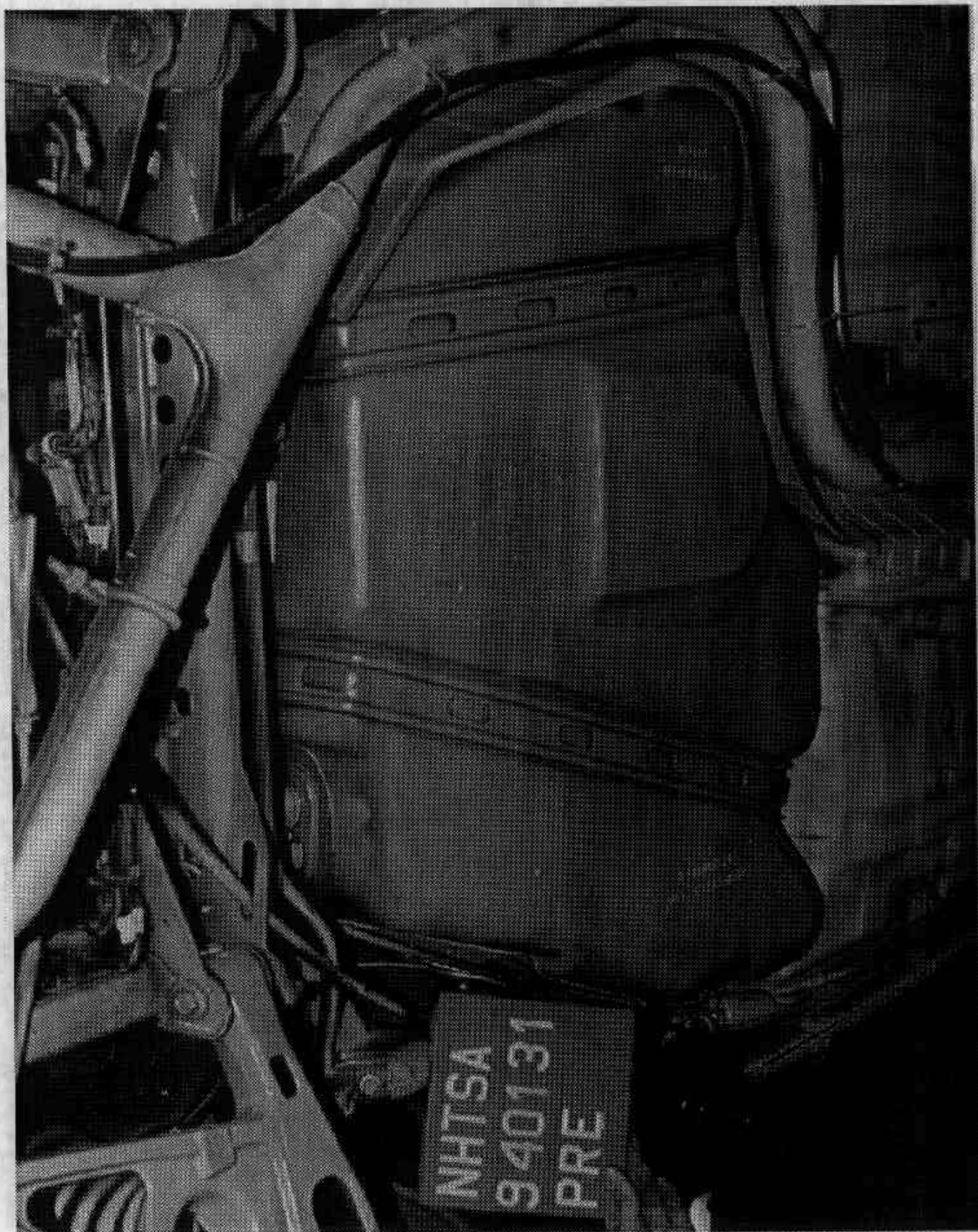


Figure A-20. PRE-TEST FUEL TANK VIEW
A-21

940131

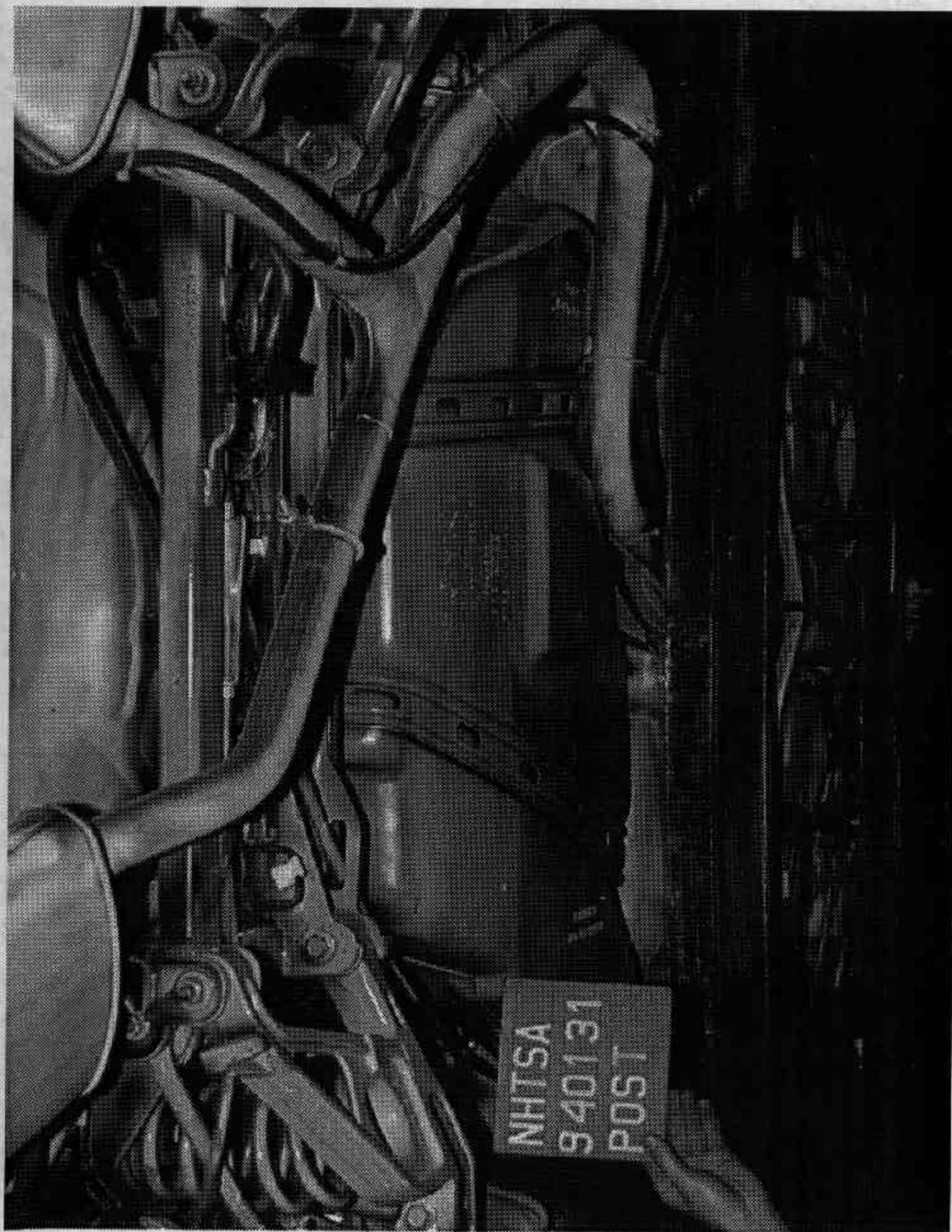


Figure A-21. POST-TEST FUEL TANK VIEW

A-22

940131

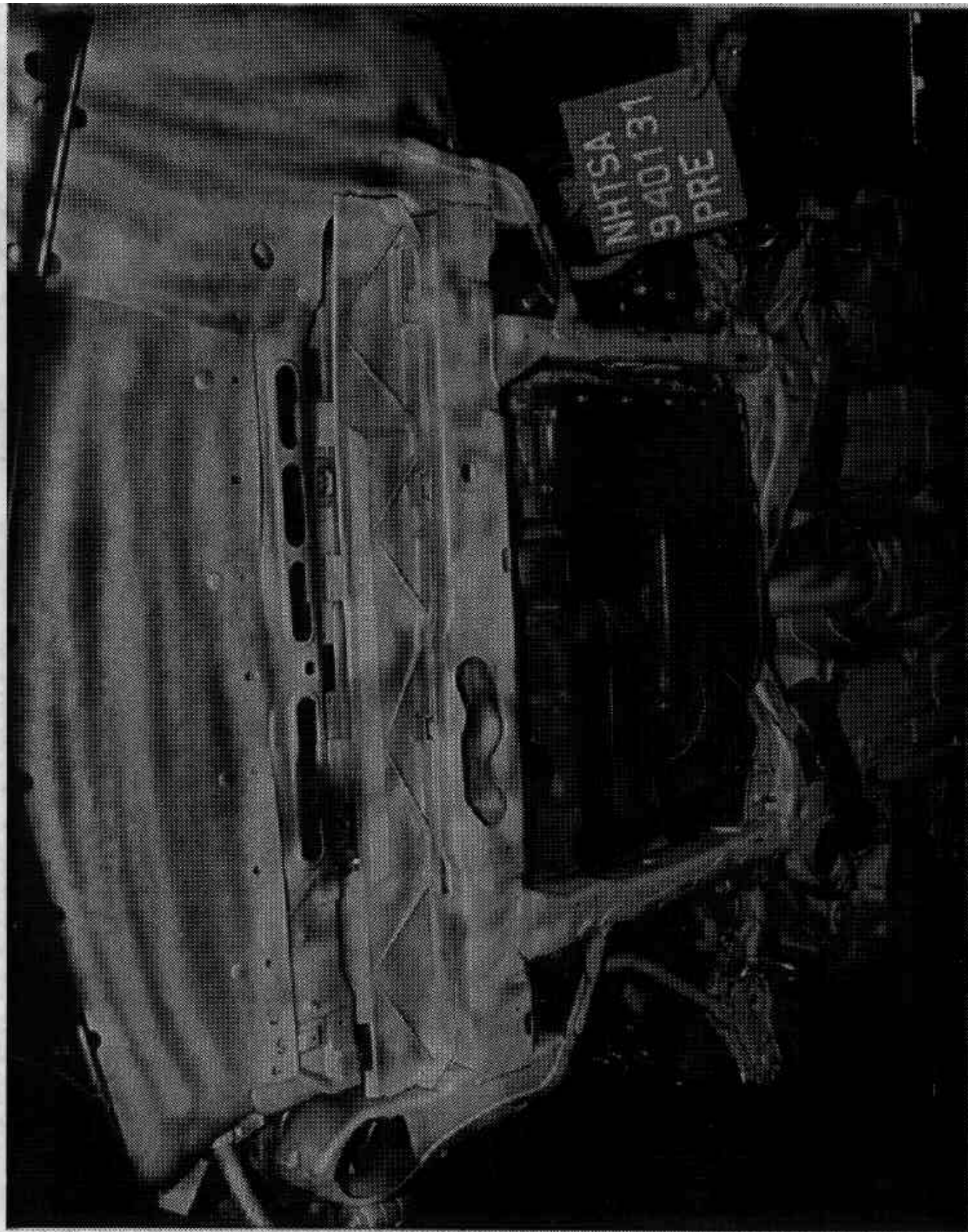


Figure A-22. PRE-TEST FRONT UNDERBODY VIEW

A-23

940131

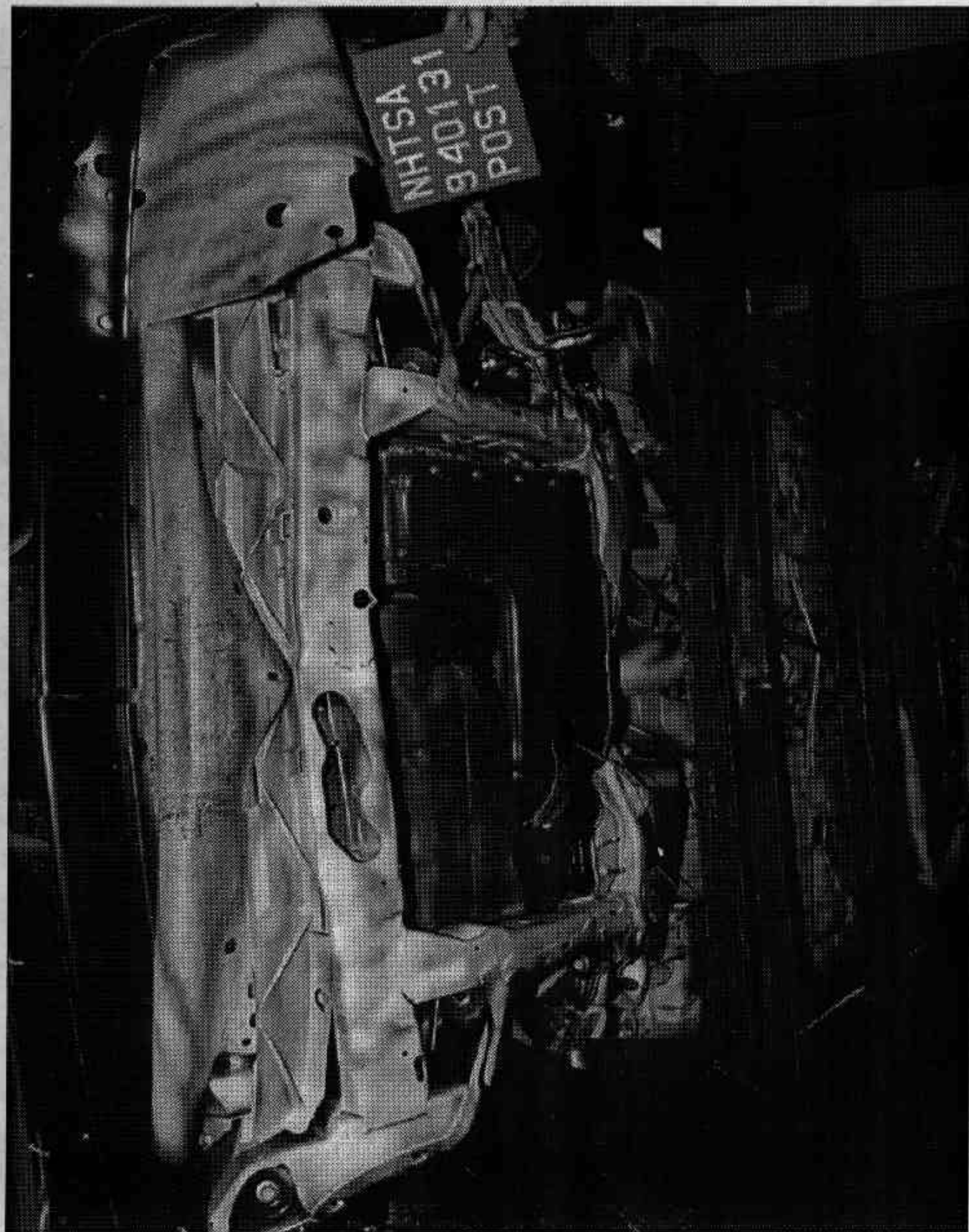


Figure A-23. POST-TEST FRONT UNDERBODY VIEW

A-24

940131

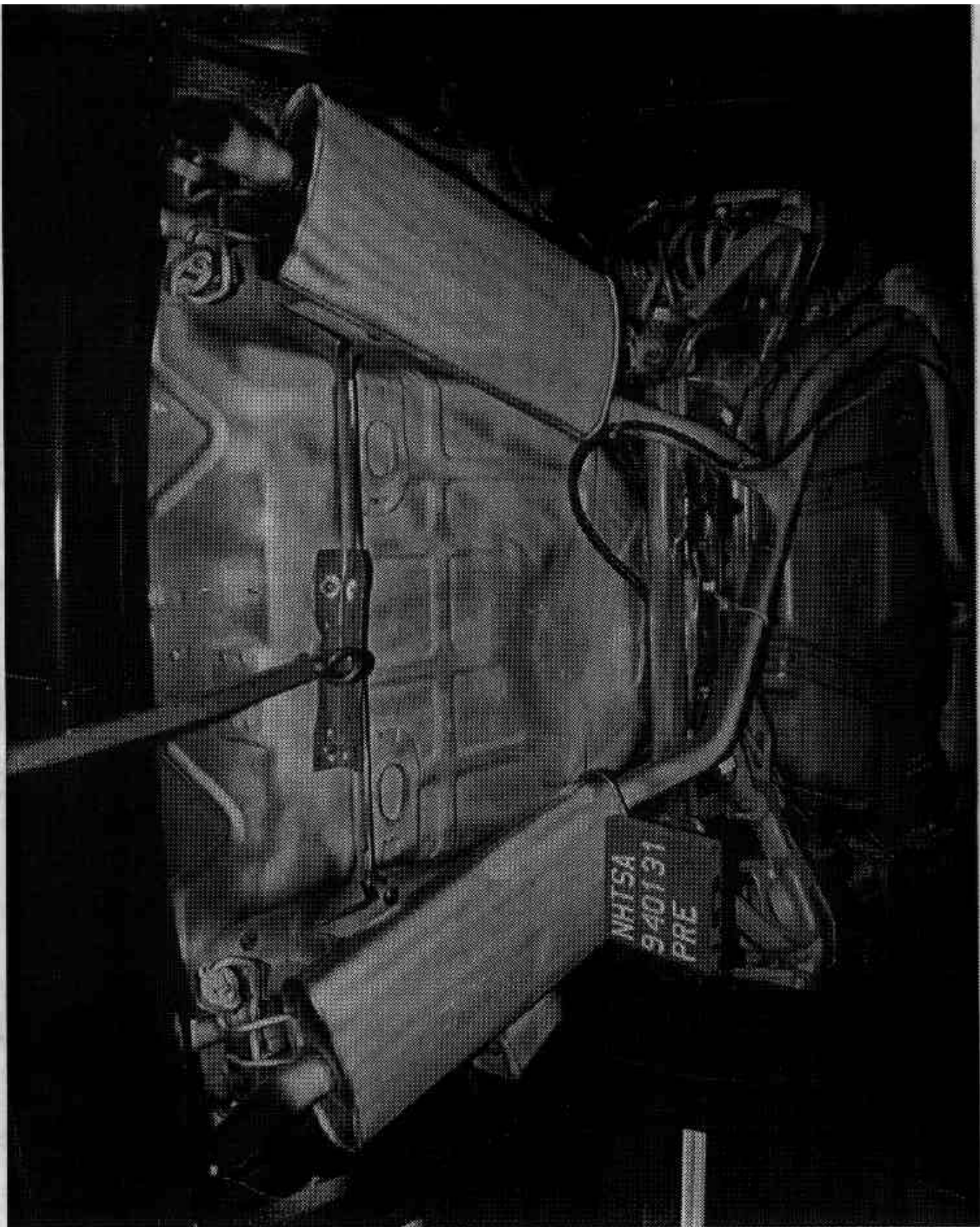


Figure A-24. PRE-TEST REAR UNDERBODY VIEW
A-25

940131

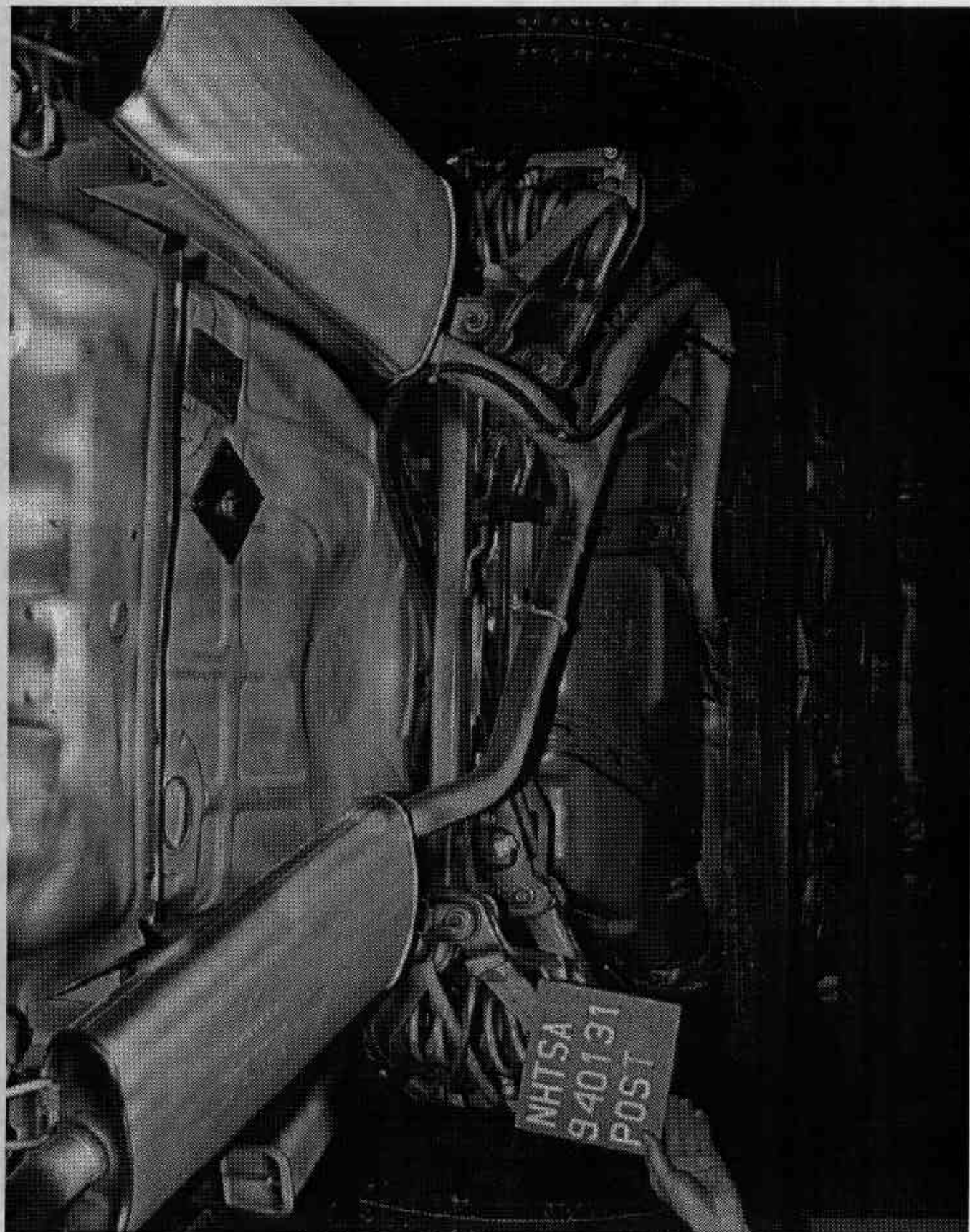


Figure A-25. POST-TEST REAR UNDERBODY VIEW

A-26

940131

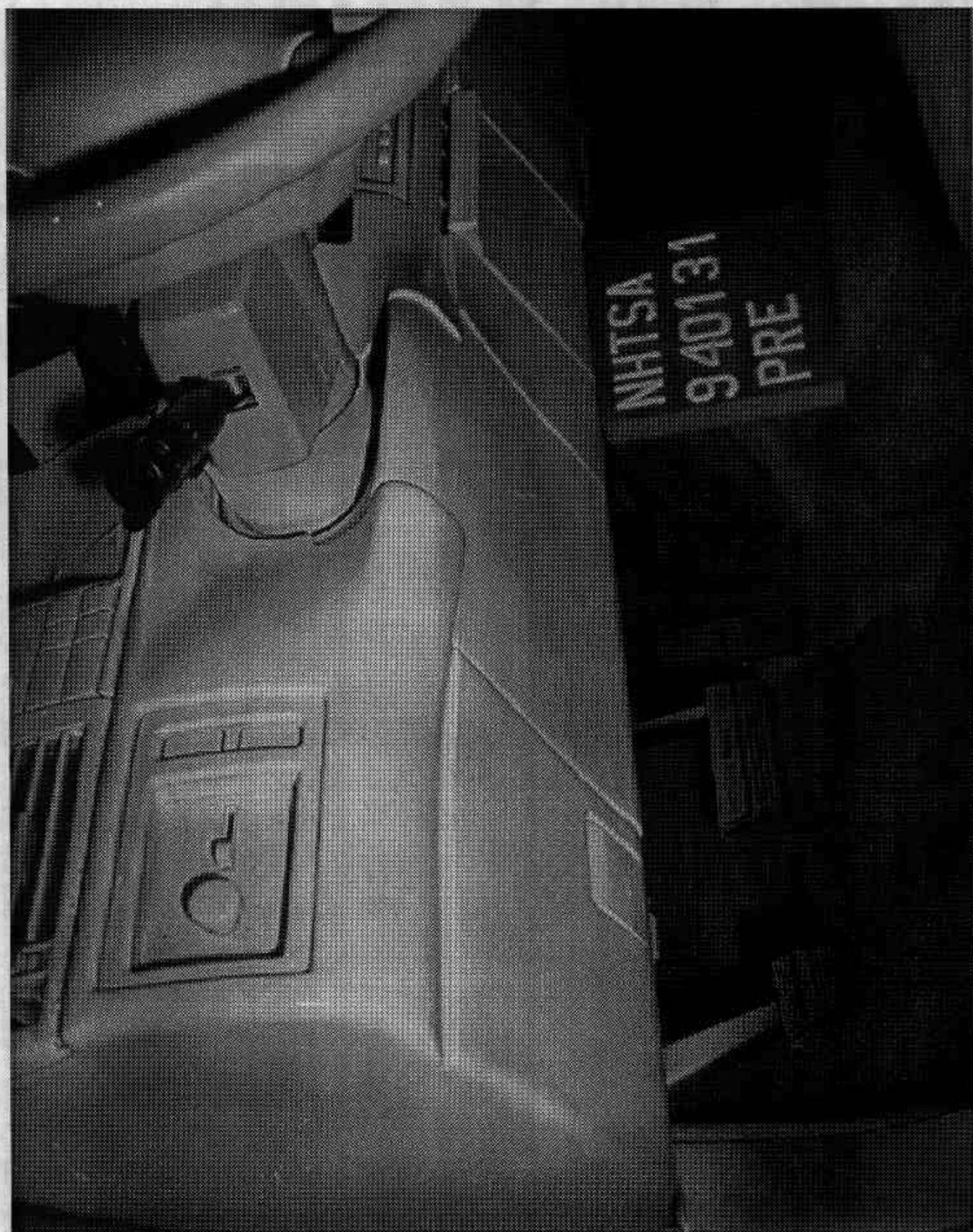


Figure A-26. PRE-TEST DRIVER'S KNEE BOLSTER VIEW

A-27

940131



Figure A-27. PRE-TEST PASSENGER'S KNEE BOLSTER VIEW

A-28

940131

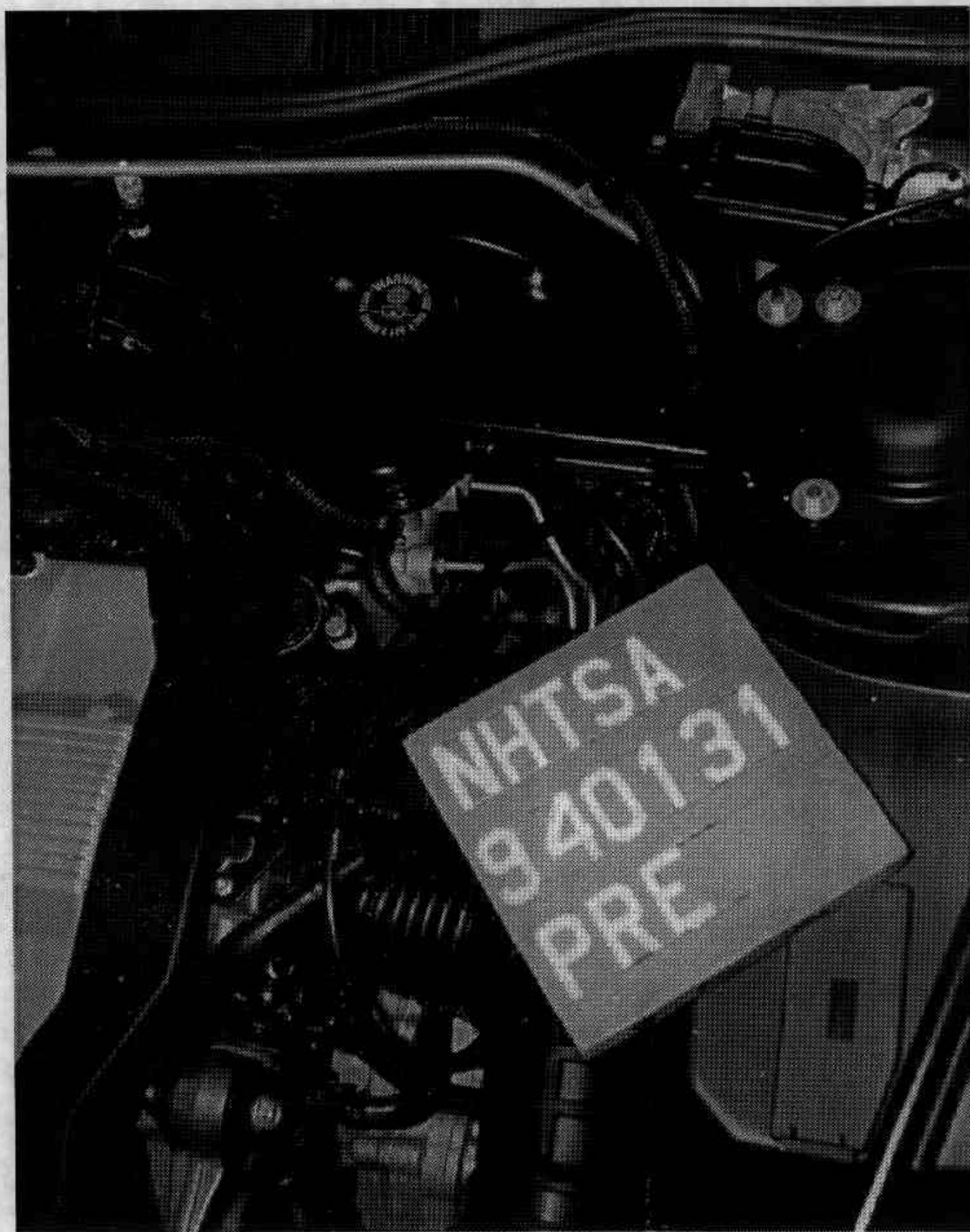


Figure A-28. PRE-TEST STEERING COLUMN AT FIREWALL VIEW

A-29

940131



Figure A-29. PRE-TEST STEERING COLUMN AT FIREWALL VIEW - INTERIOR

A-30

940131

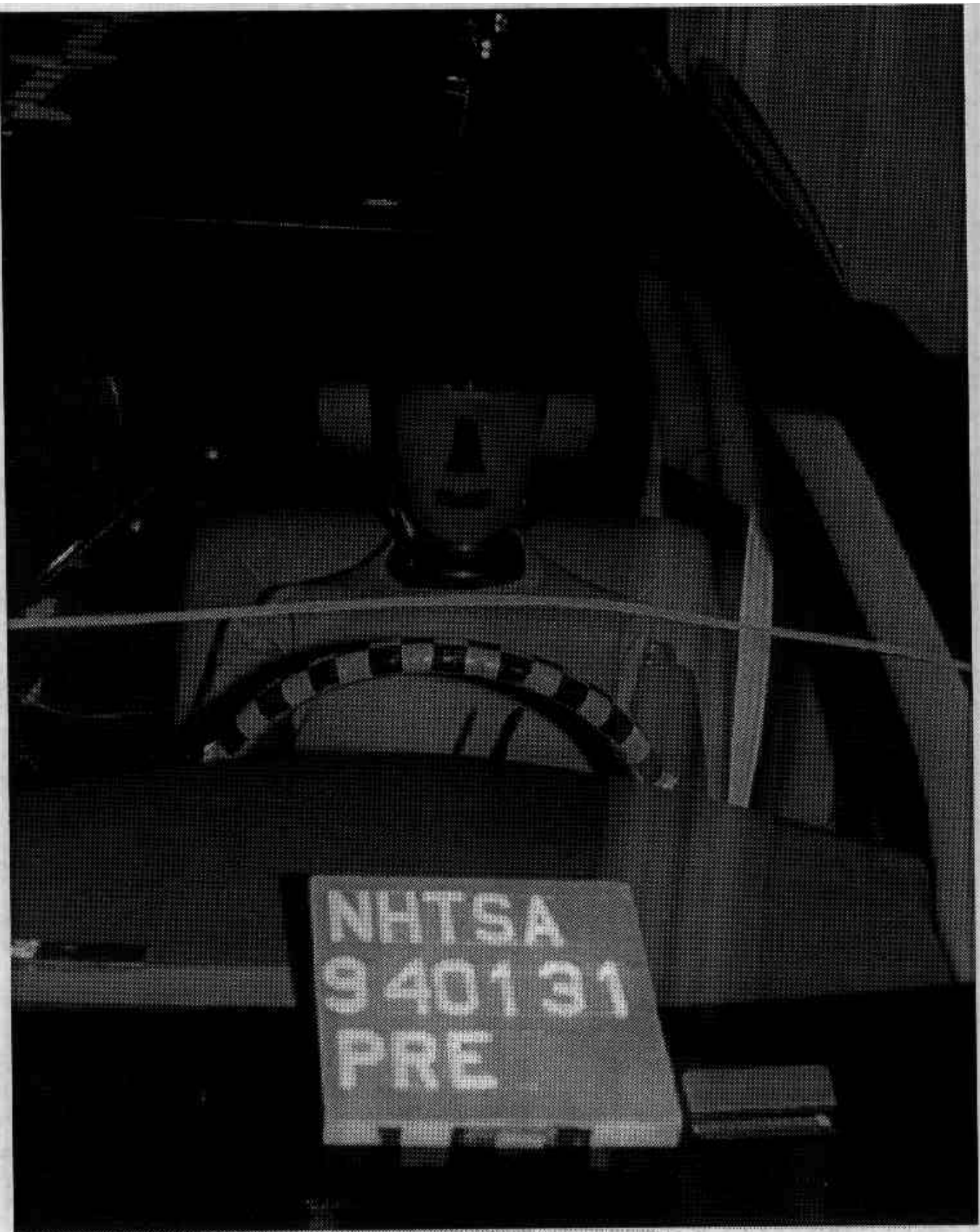


Figure A-30. PRE-TEST DRIVER DUMMY POSITION - VIEW 1

A-31

940131

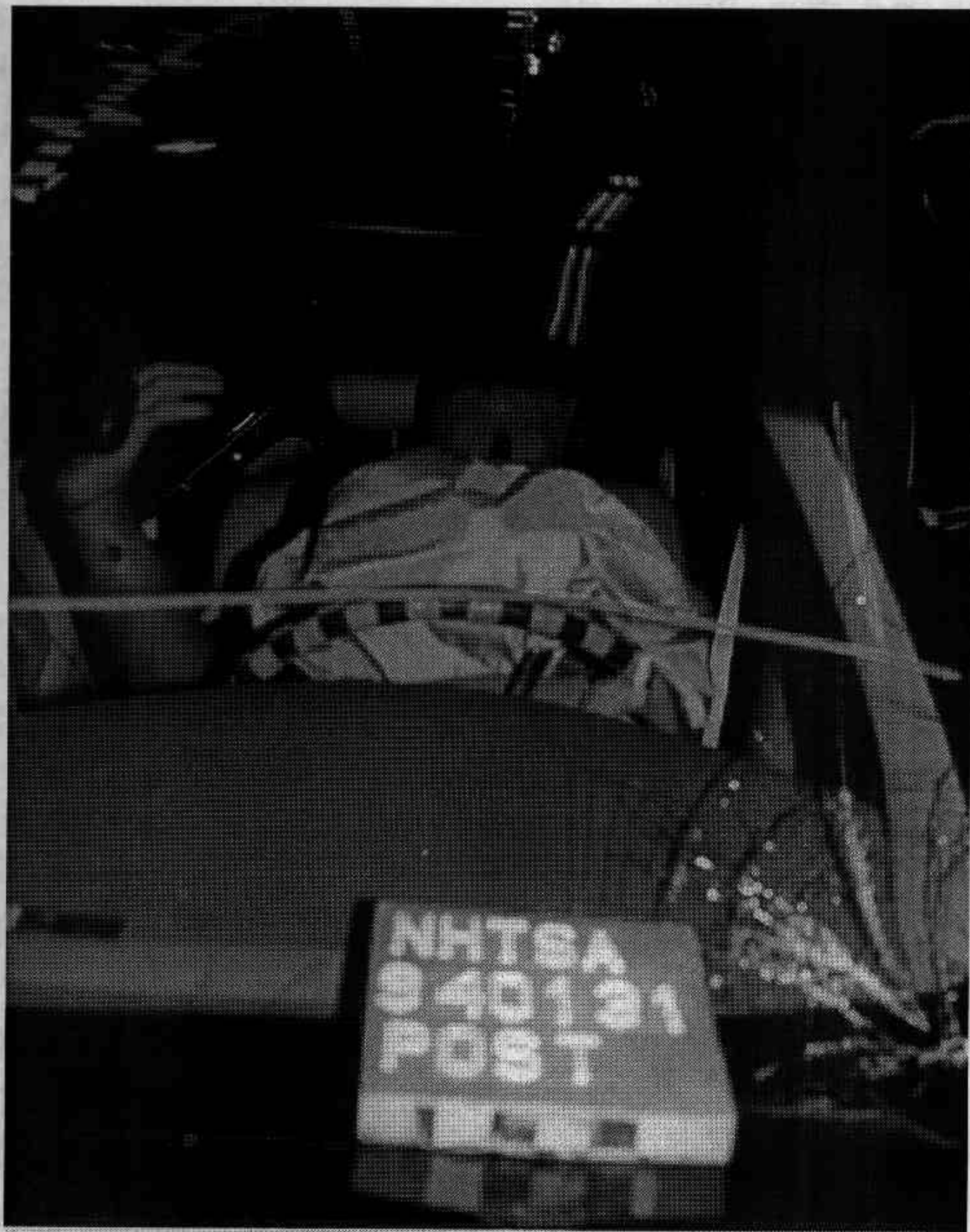


Figure A-31. POST-TEST DRIVER DUMMY POSITION - VIEW 1

A-32

940131



Figure A-32. PRE-TEST DRIVER DUMMY POSITION - VIEW 2

A-33

940131

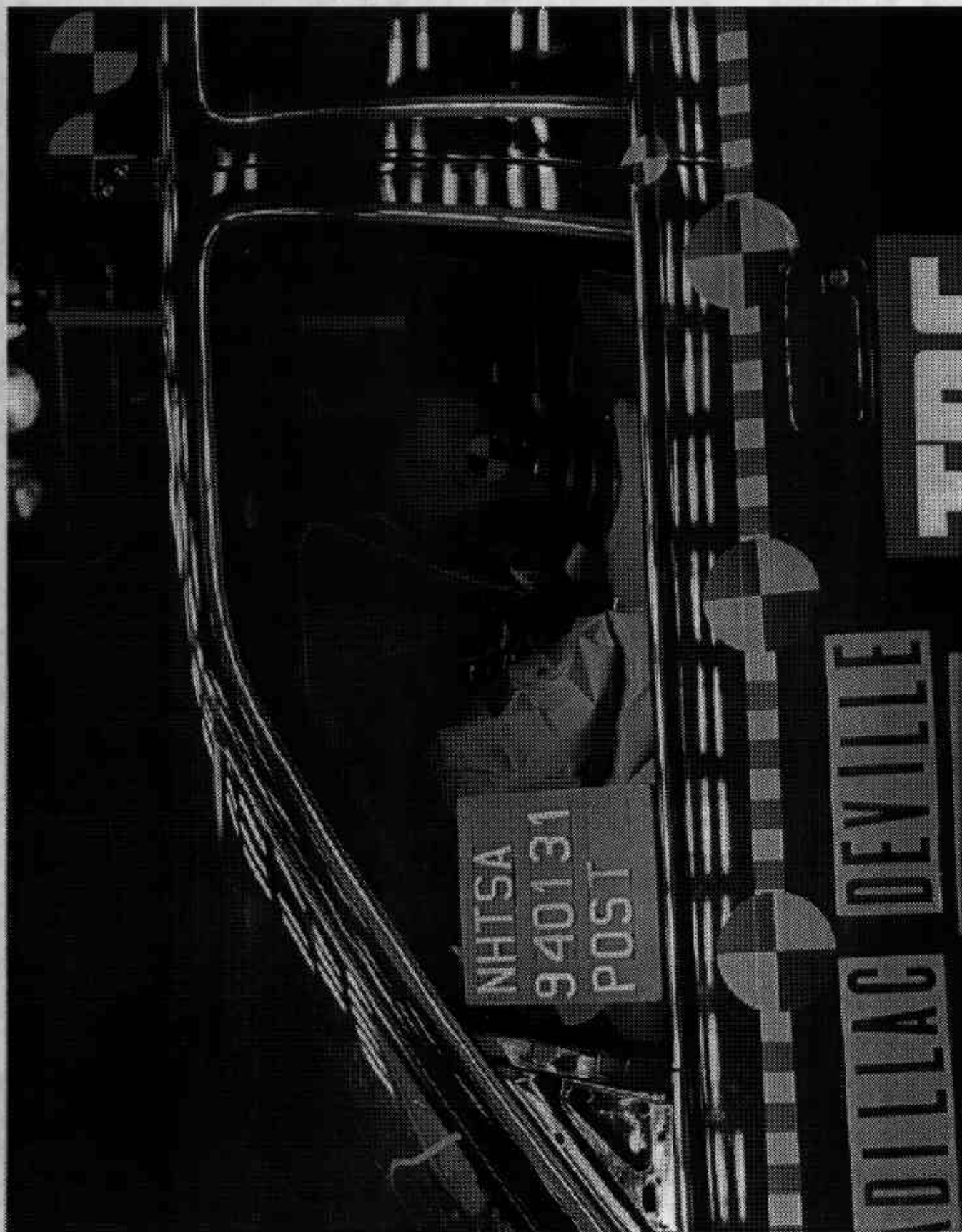


Figure A-33. POST-TEST DRIVER DUMMY POSITION - VIEW 2

A-34

940131

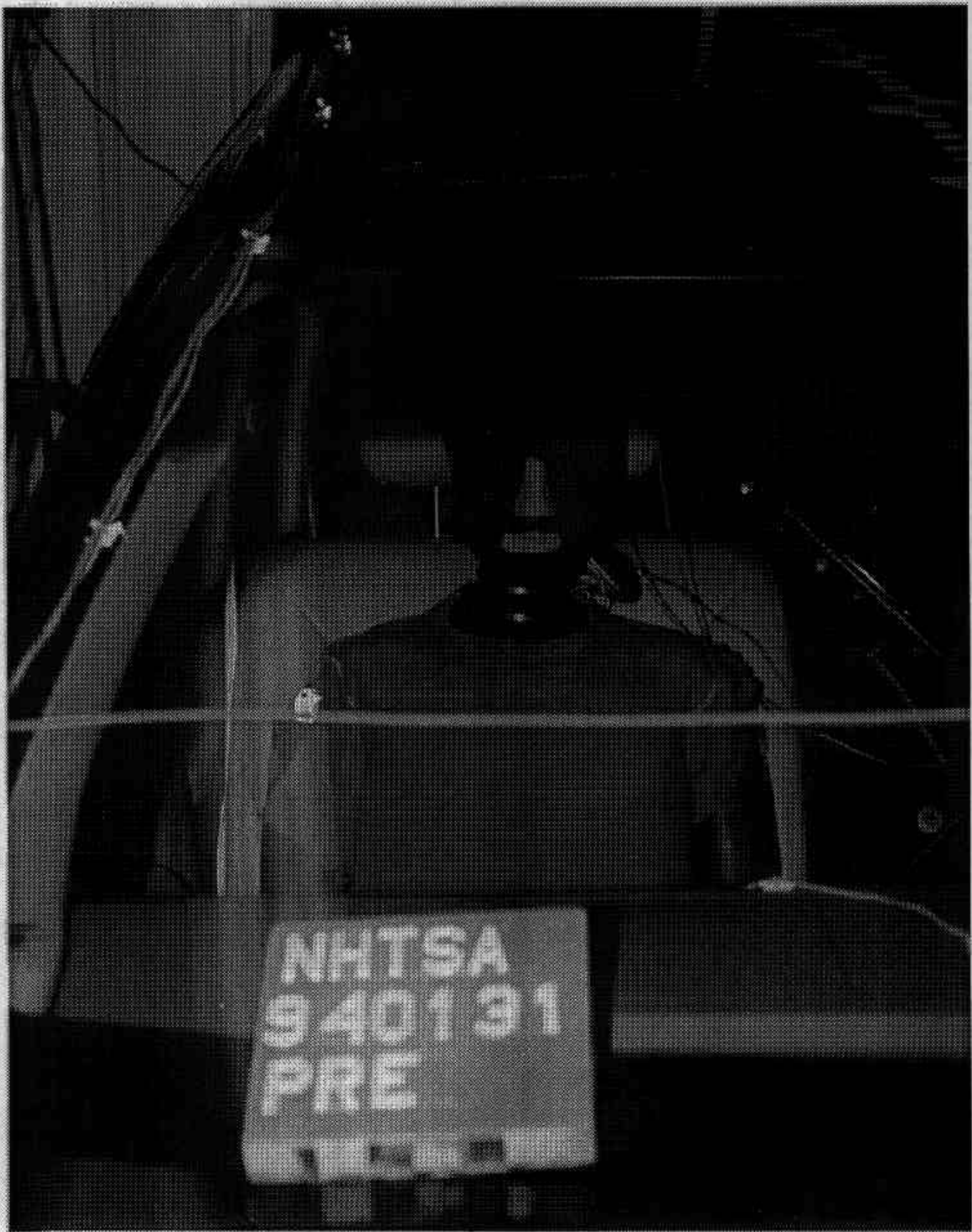


Figure A-34. PRE-TEST PASSENGER DUMMY POSITION - VIEW 1

A-35

940131

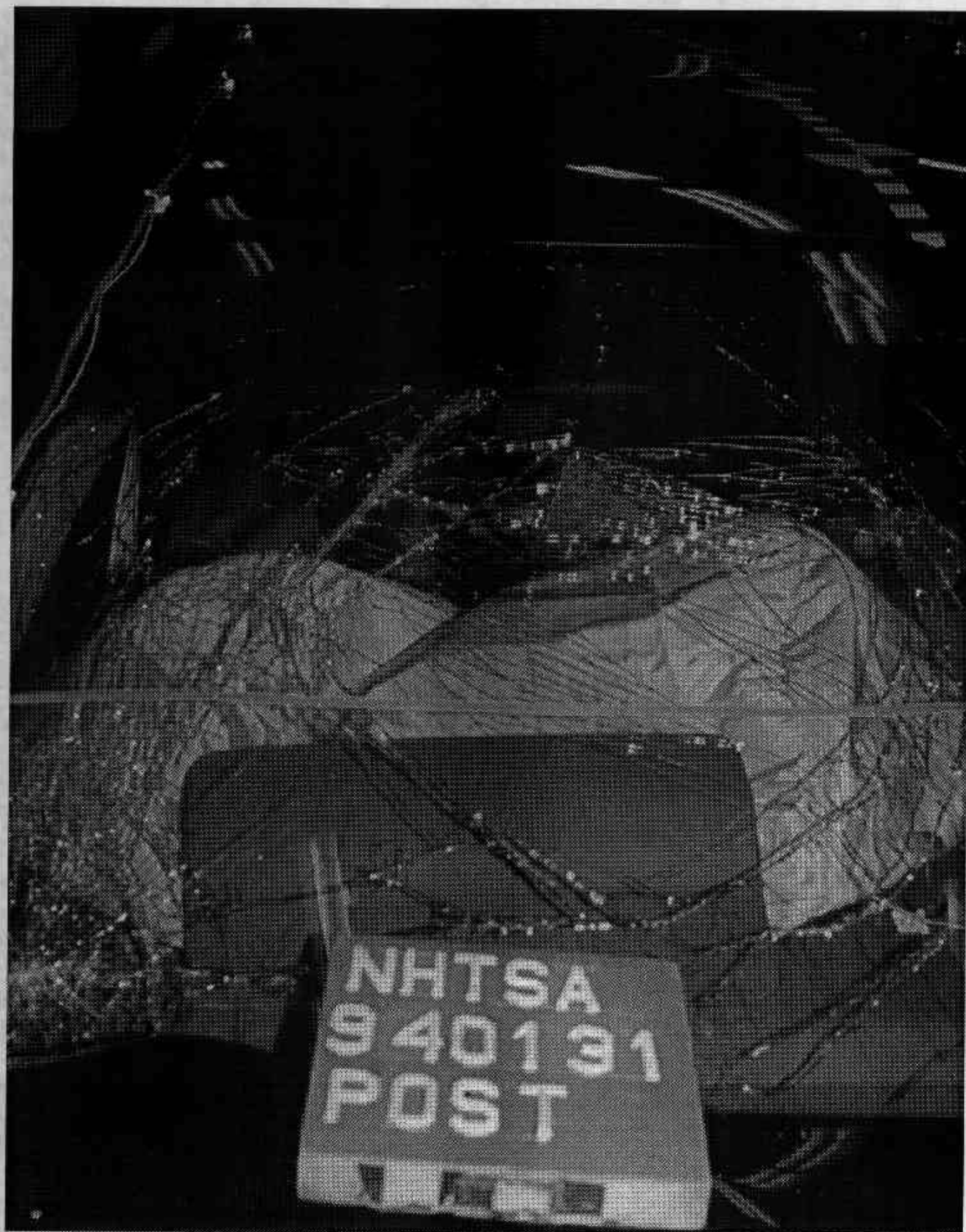


Figure A-35. POST-TEST PASSENGER DUMMY POSITION - VIEW 1

A-36

940131

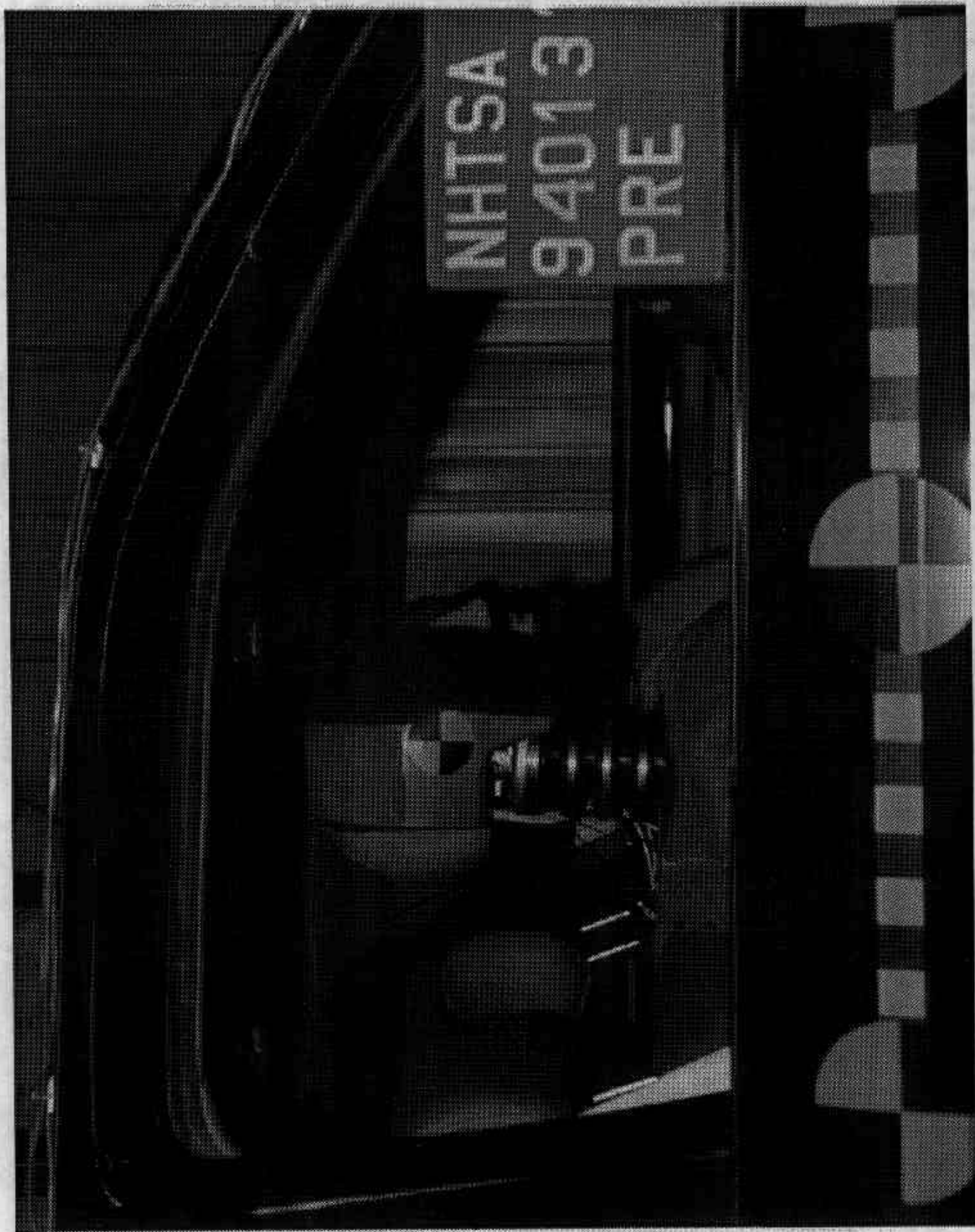


Figure A-36. PRE-TEST PASSENGER DUMMY POSITION - VIEW 2

A-37

940131

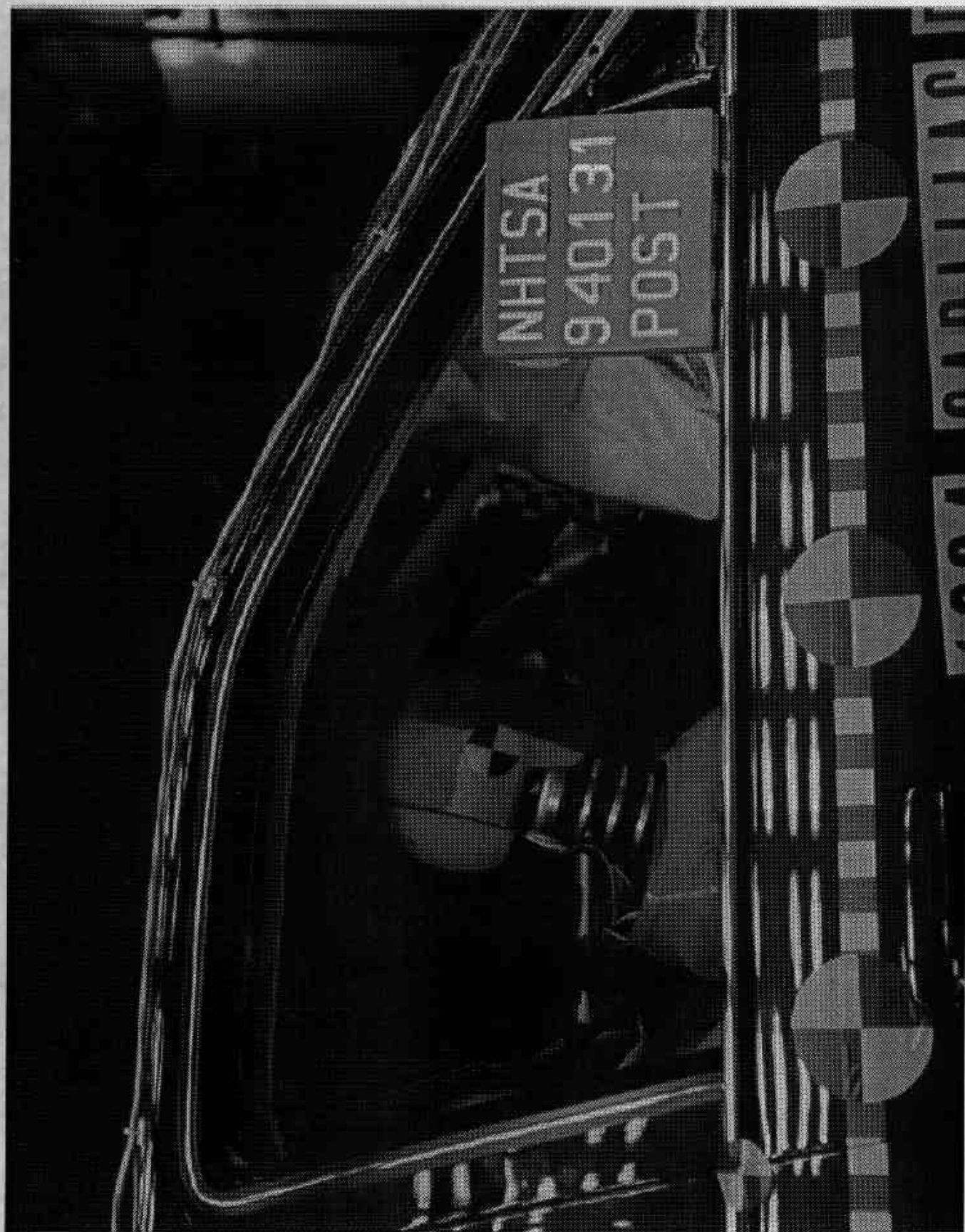


Figure A-37. POST-TEST PASSENGER DUMMY POSITION - VIEW 2

A-38

940131

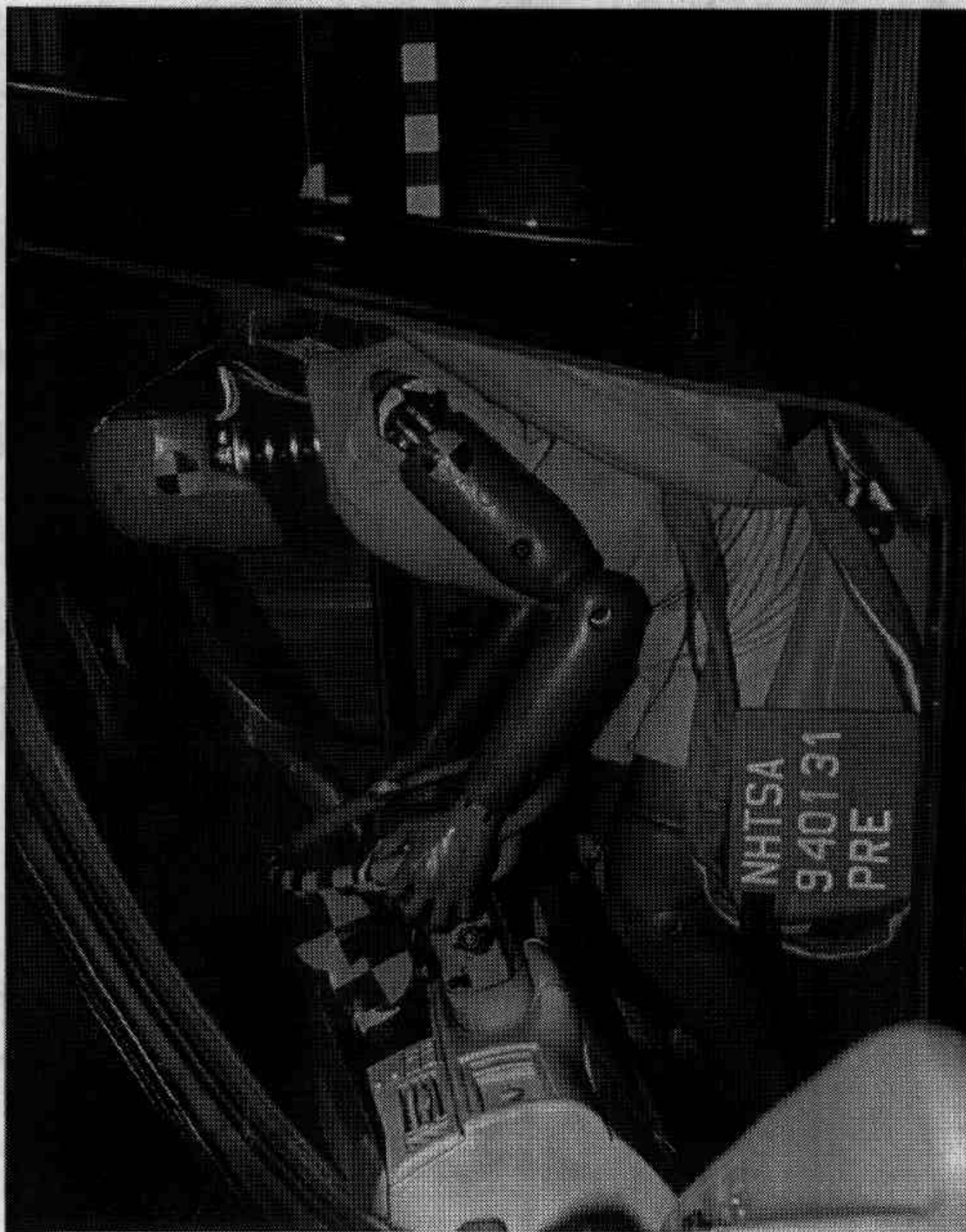


Figure A-38. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-39

940131



Figure A-39. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-40

940131

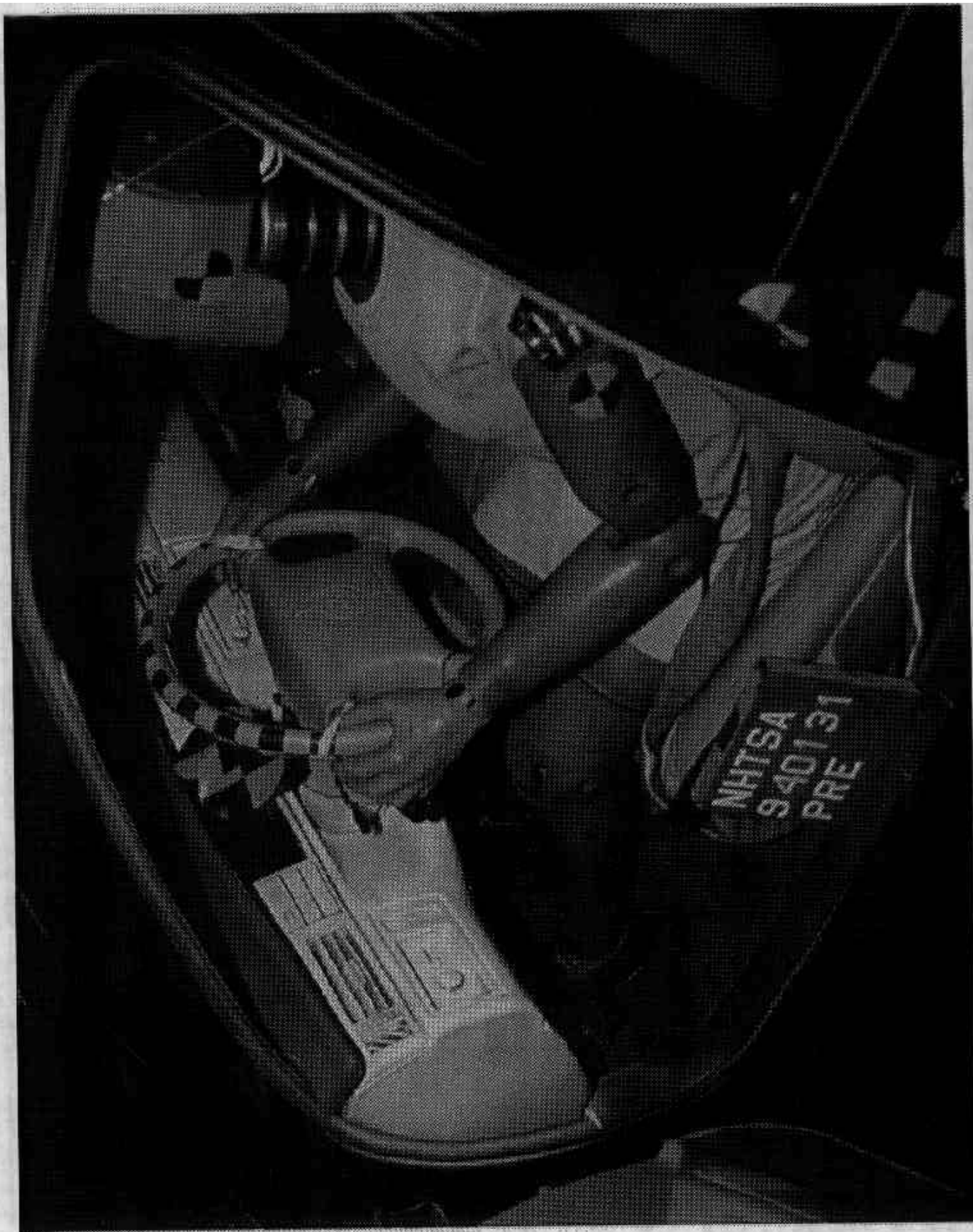


Figure A-40. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
A-41 940131



Figure A-41. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

A-42

940131



Figure A-42. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

A-43

940131

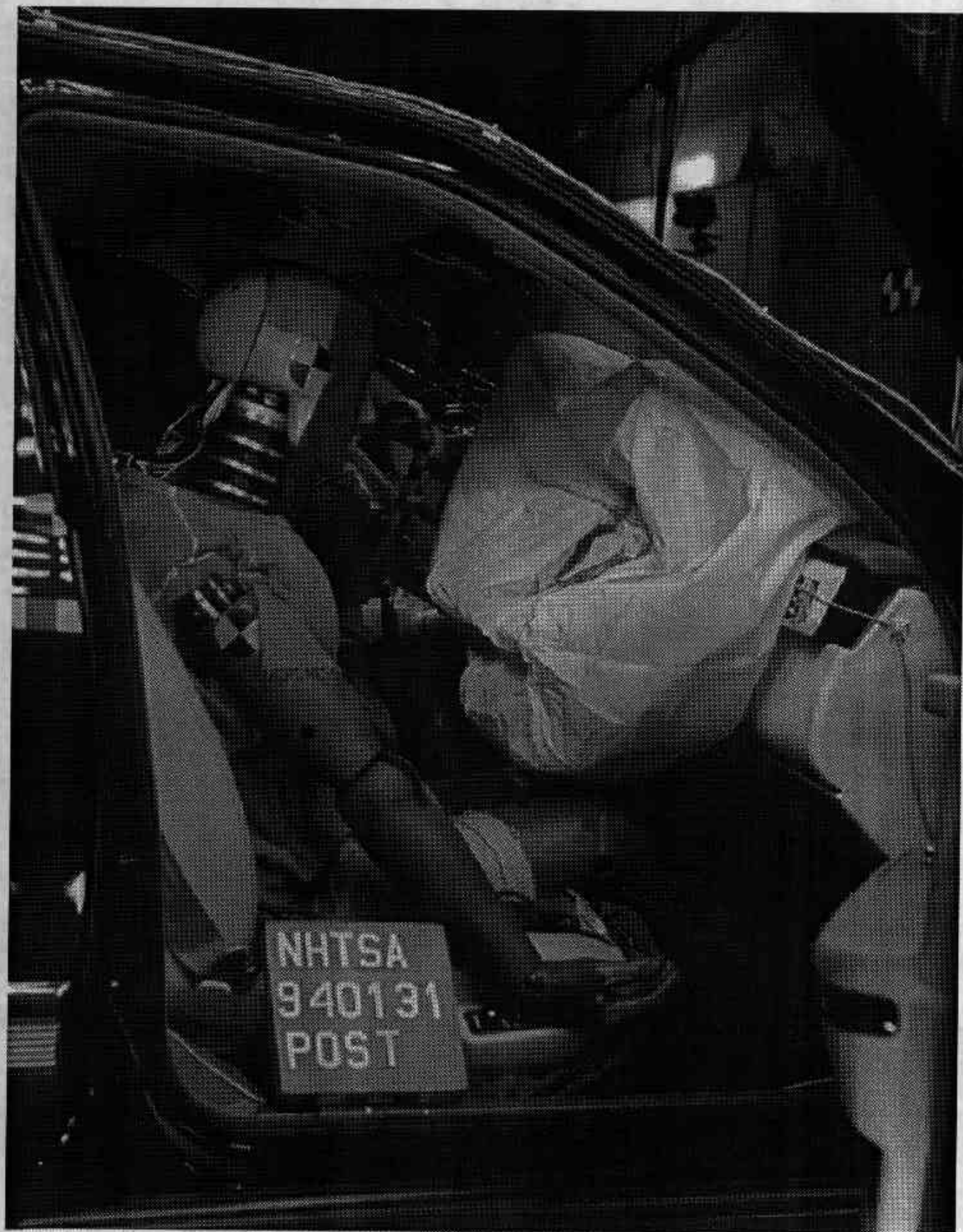


Figure A-43. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

A-44

940131

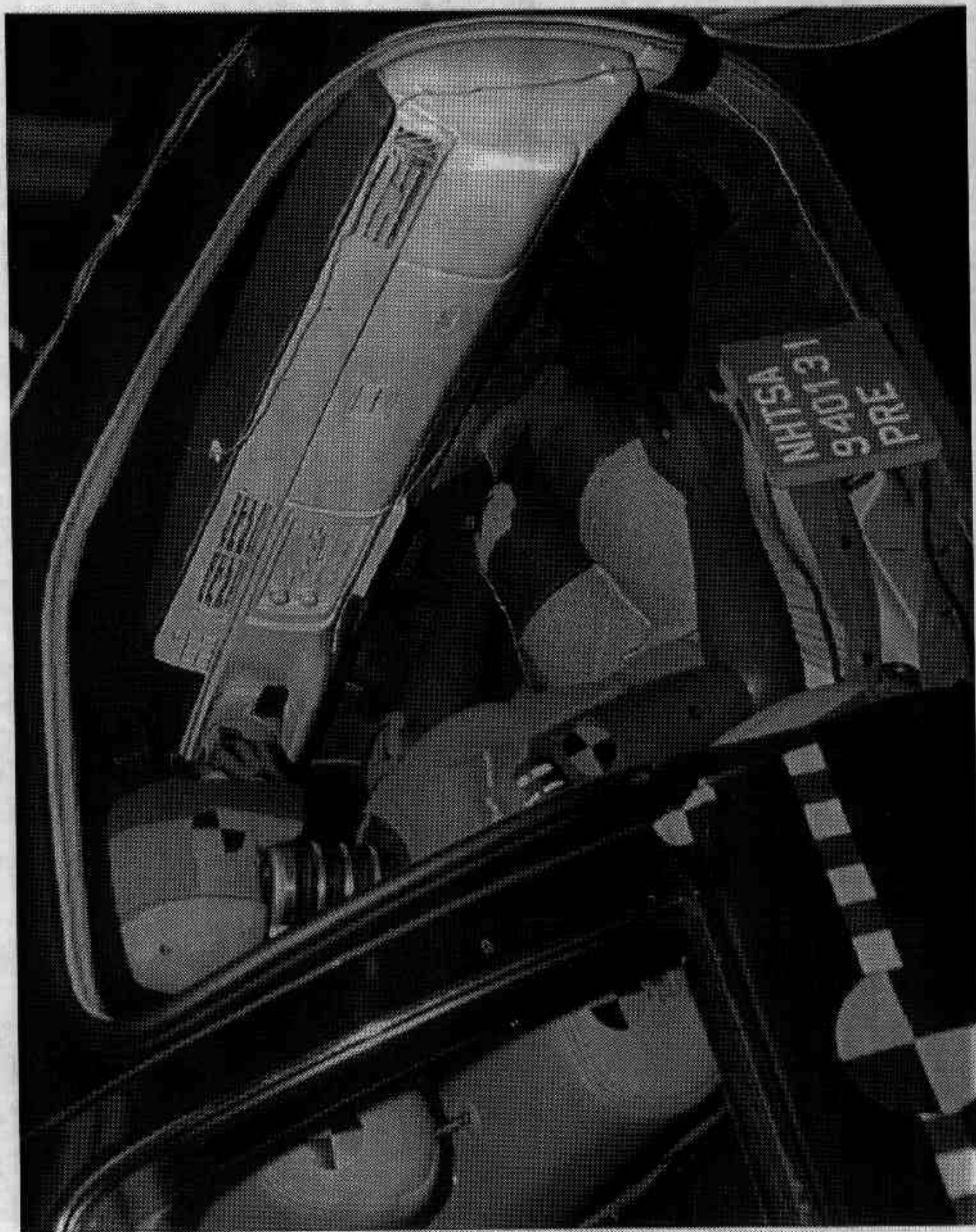


Figure A-44. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

A-45

940131



Figure A-45. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

A-46

940131

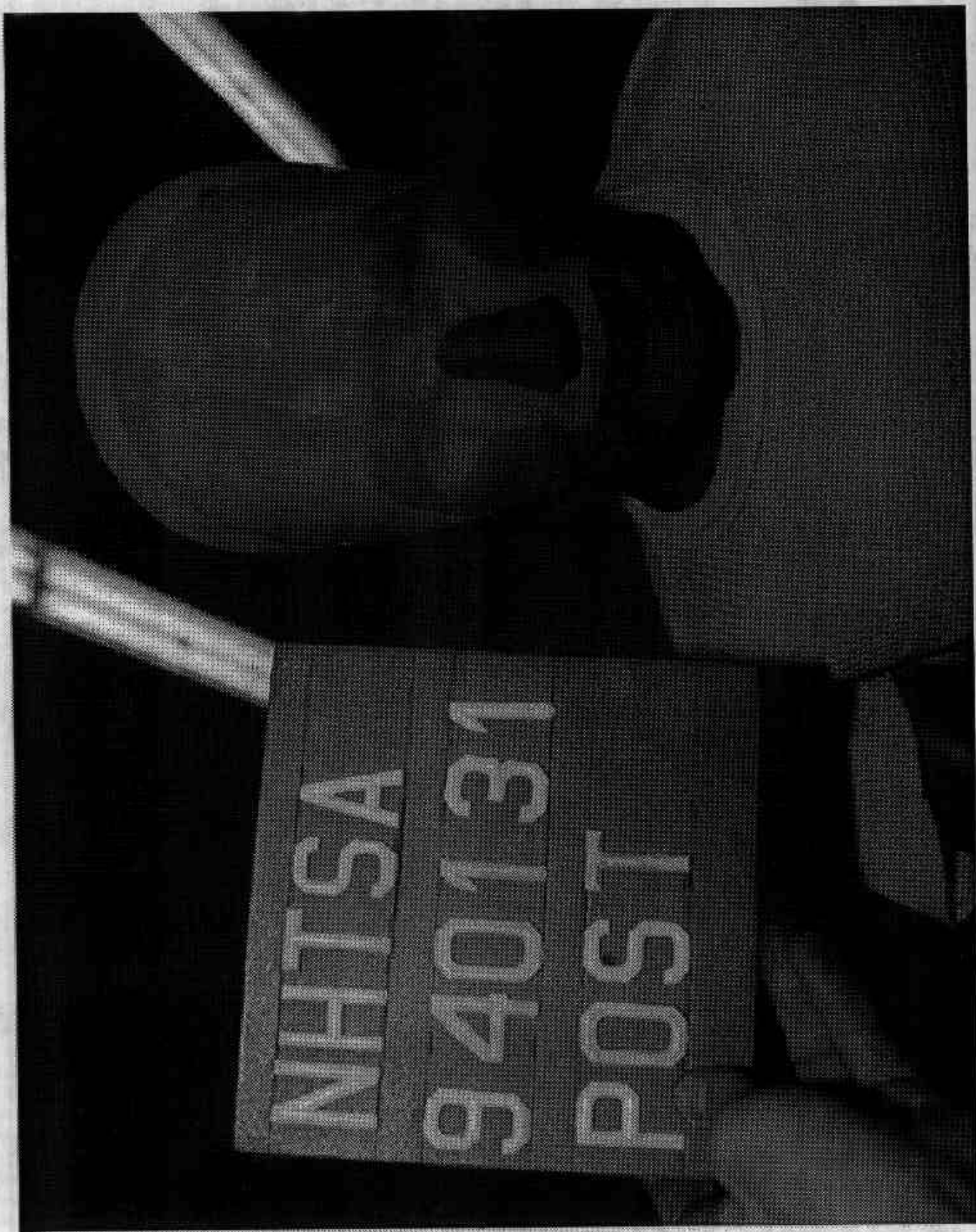


Figure A-46. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

A-47

940131



Figure A-47. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2

A-48

940131

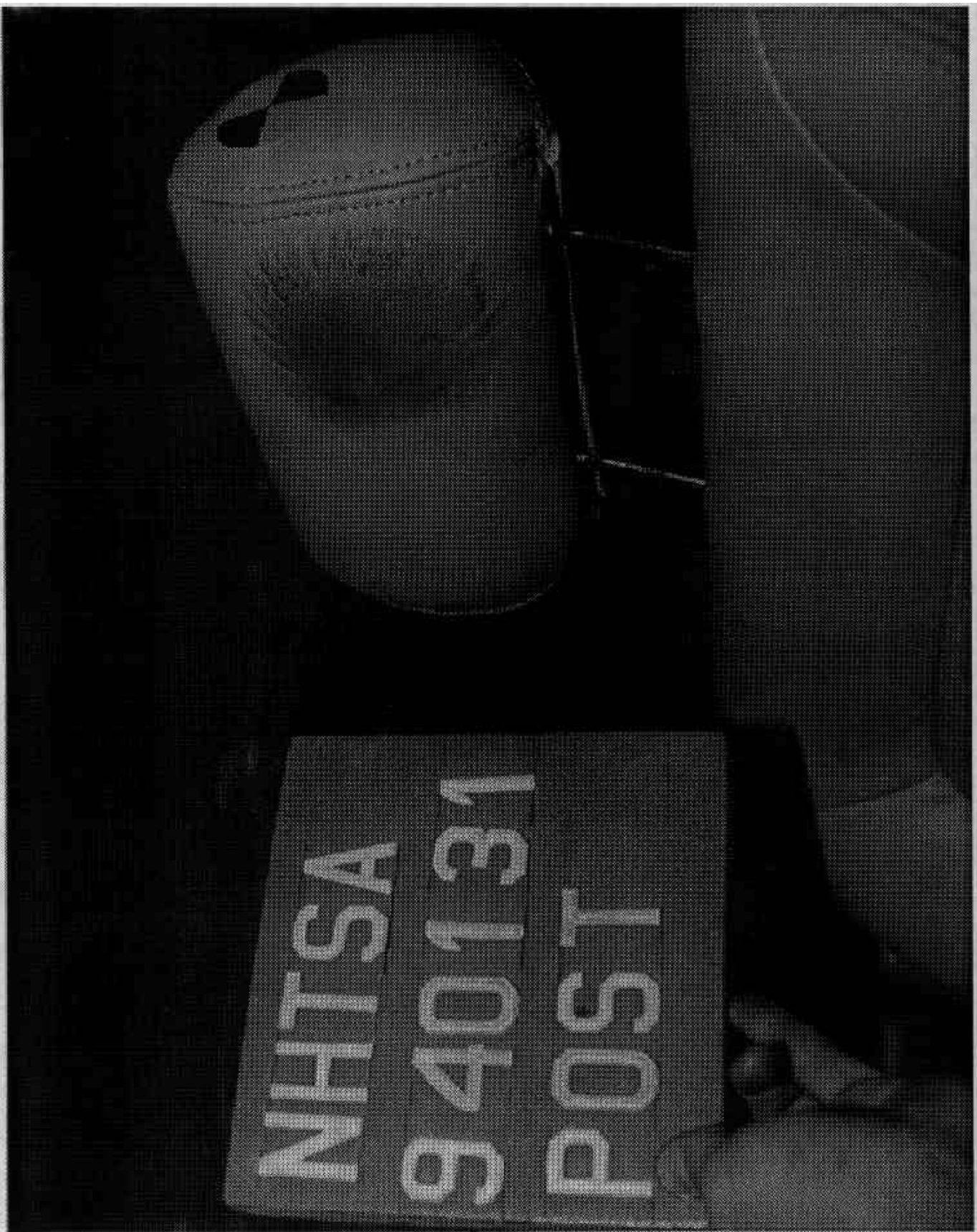


Figure A-48. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 3

A-49

940131



Figure A-49. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

A-50

940131

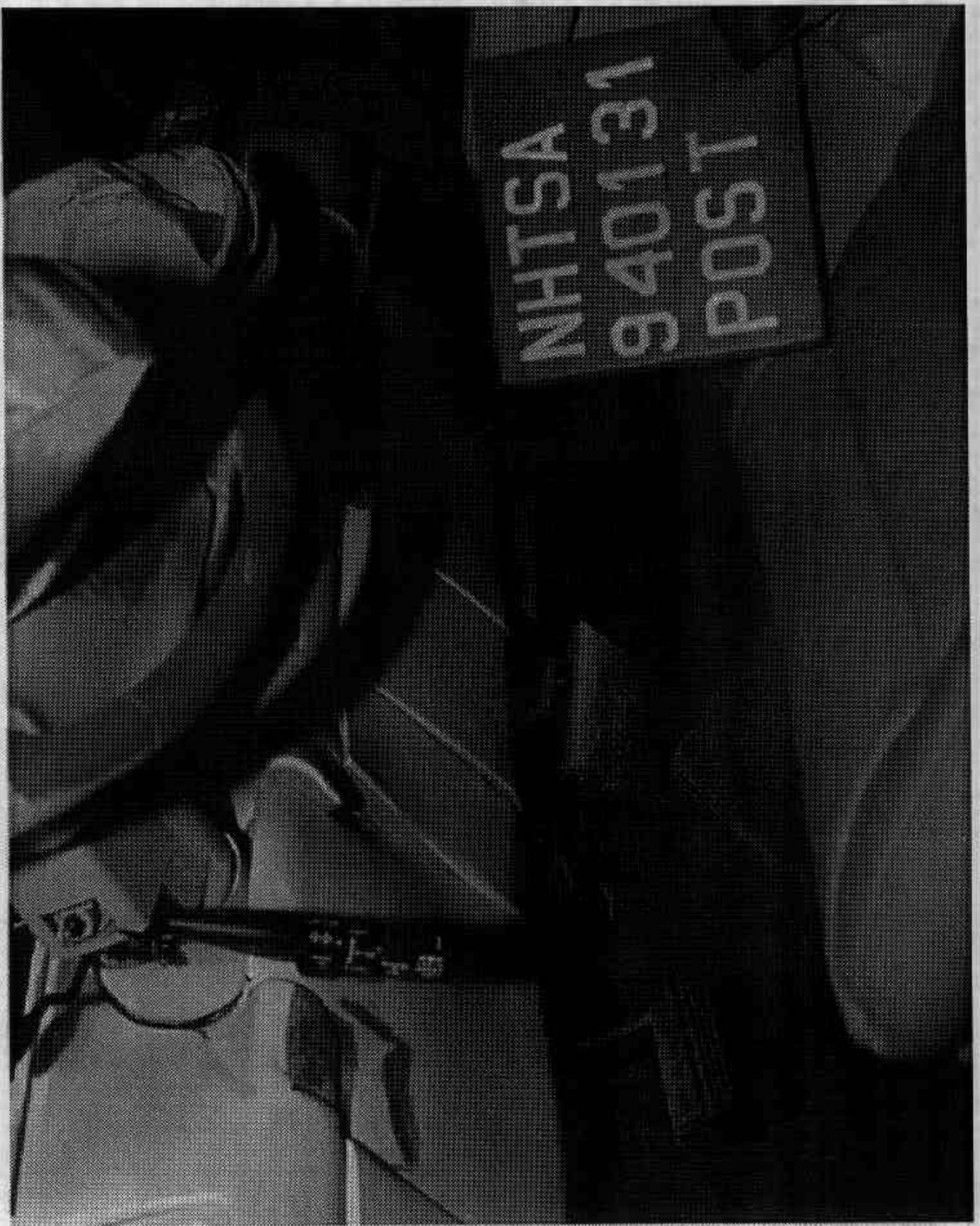


Figure A-50. POST-TEST DRIVER DUMMY KNEE CONTACT- VIEW 2

A-51

940131

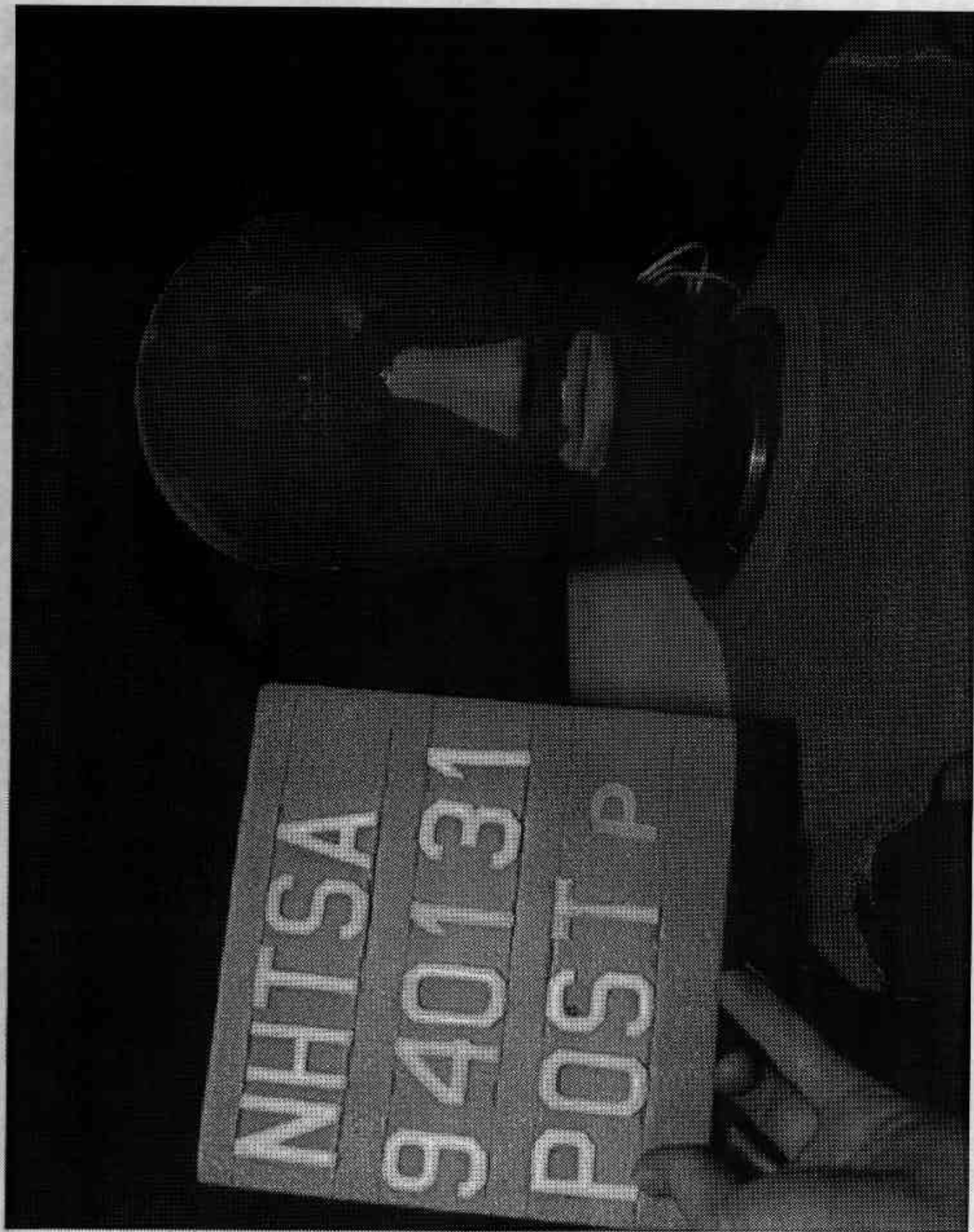


Figure A-51. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 1
A-52 940131

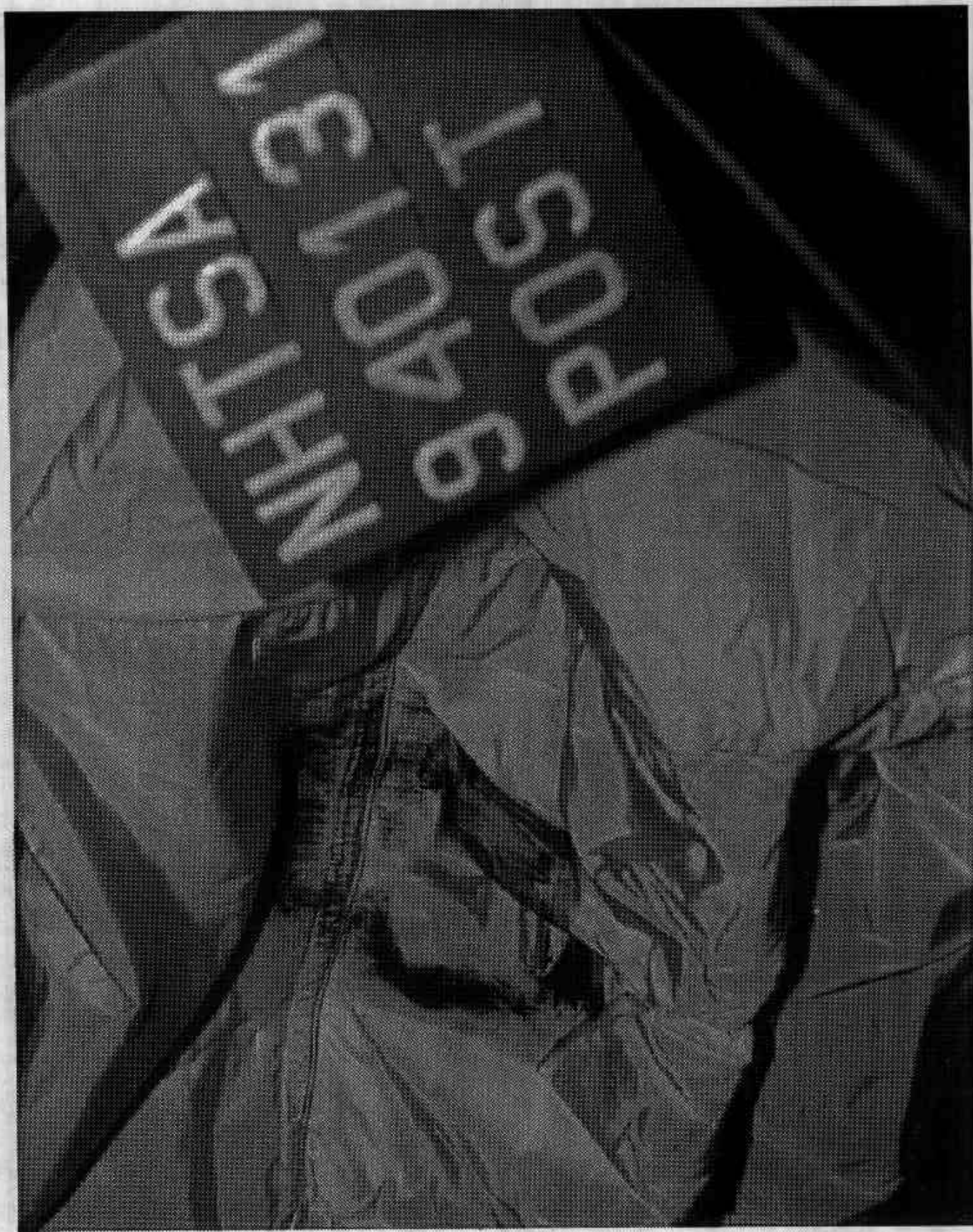


Figure A-52. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 2
A-53 940131



Figure A-53. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1
A-54 940131



Figure A-54. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2
A-55 940131


APD BY GENERAL MOTORS CORP.
 DATE GVWR GVW FRT LTRK WT
 11/93 1140LB 2784LB 2150LB
 2332KG 1263KG 1000KG
 THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
 106K152Y3K022274 PAGE TWO
 GEM


TIRE-LOADING INFORMATION
 OCCUPANTS VEHICLE CAP. WT.
 FRT. CTR. RR. TOTAL LBS. KG.
 3 0 3 6 1107 500
 MAX. LOADING & GVWR SAME AS VEHICLE
 CAPACITY WEIGHT. KGS. COLD TIRE
 MODEL-RFVY SPEED PRESSURE
 TIRE SIZE
 FRT P225/60R16 KTG 352KPA
 RE P225/60R16 M 10/210
 SPN 1125/70R15 M 30/210
 IF TIRES ARE HOT, ADD 4PSI/28KPA
 SEE OWNER'S MANUAL FOR ADDITIONAL
 INFORMATION
 GEM GEM

Fig A-55. PRE-TEST VEHICLE CERT. & RECOMMENDED TIRE PRES. LABELS

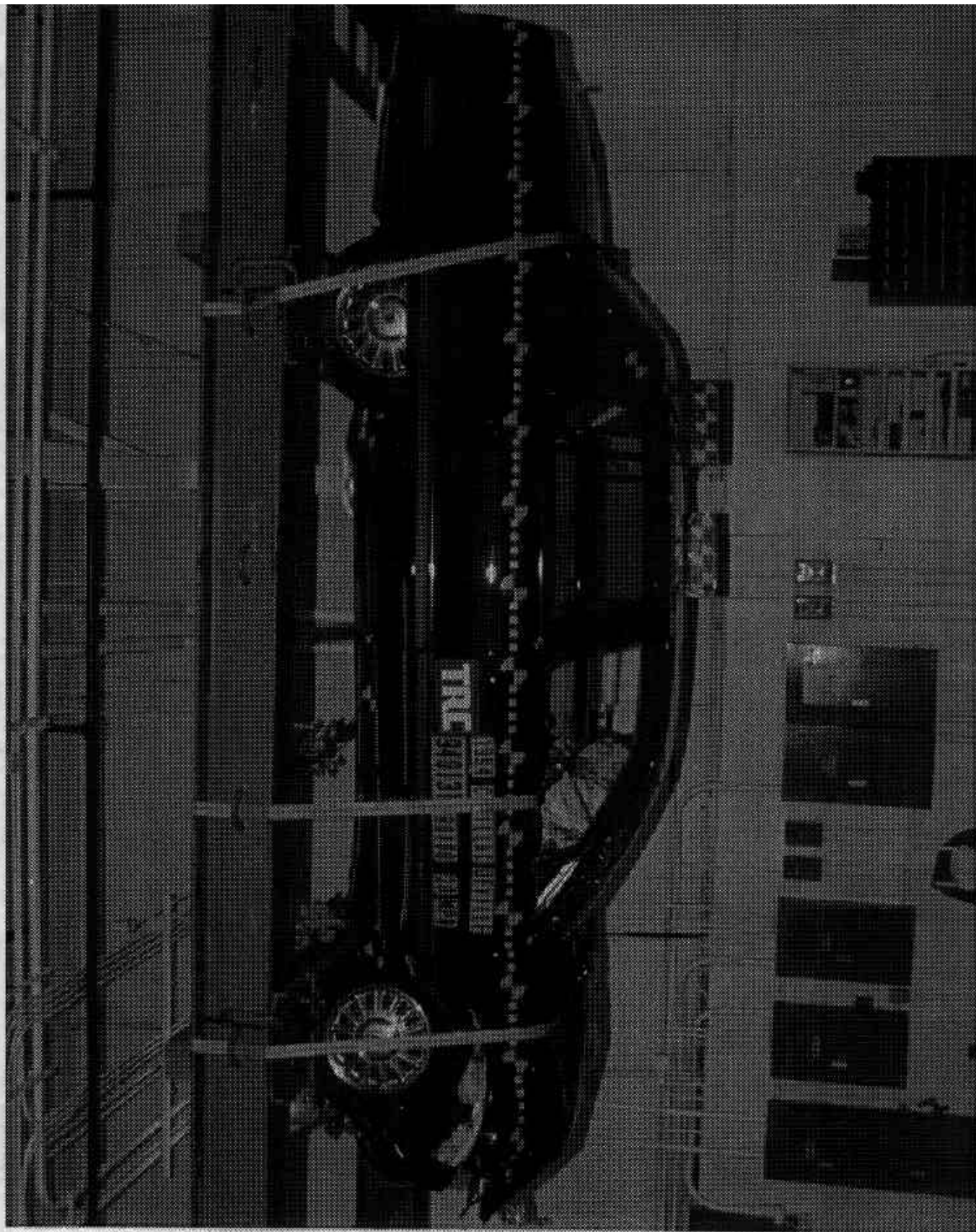


Figure A-56. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW
A-57 940131

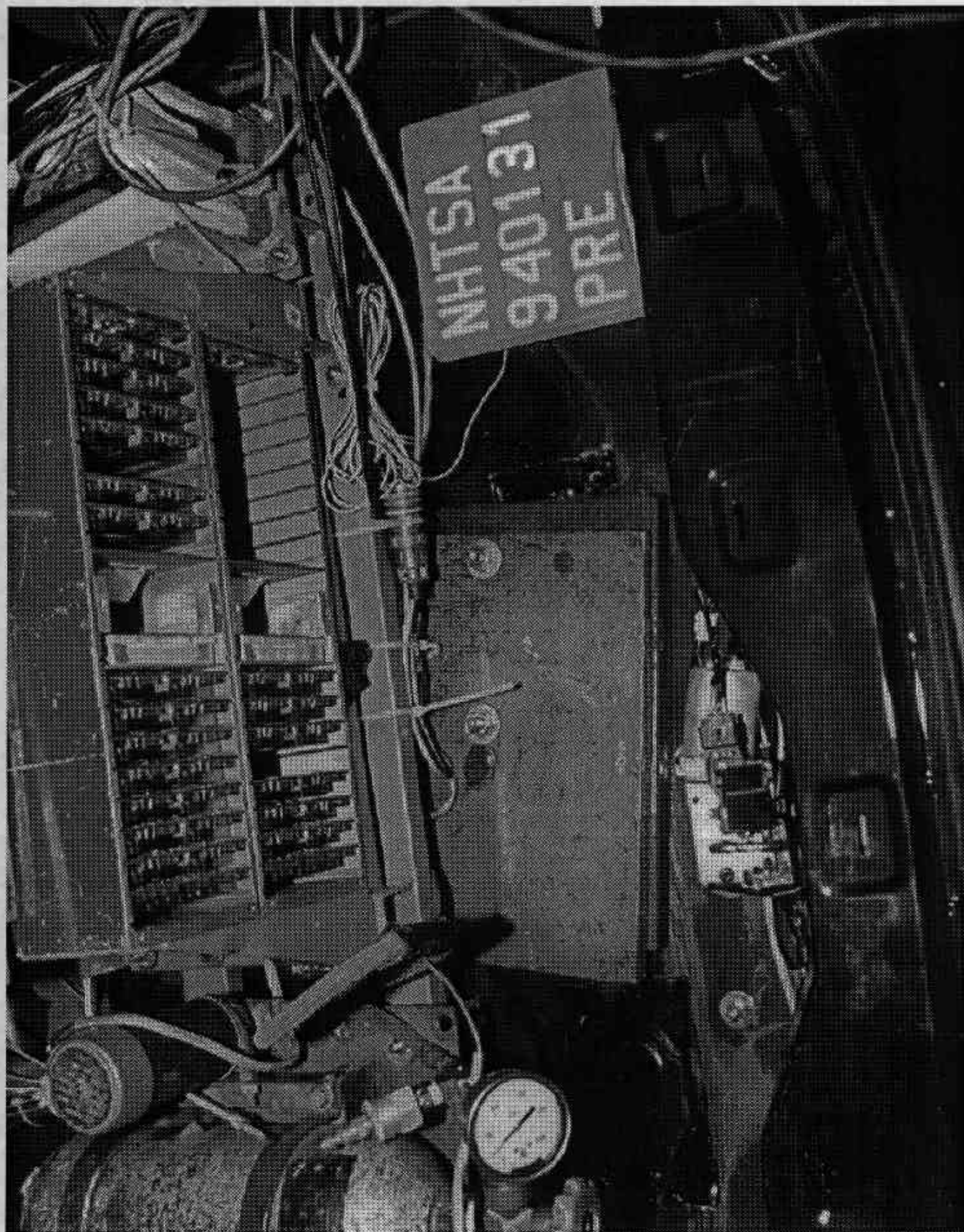


Figure A-57. PRE-TEST BALLAST LOCATION VIEW
A-58

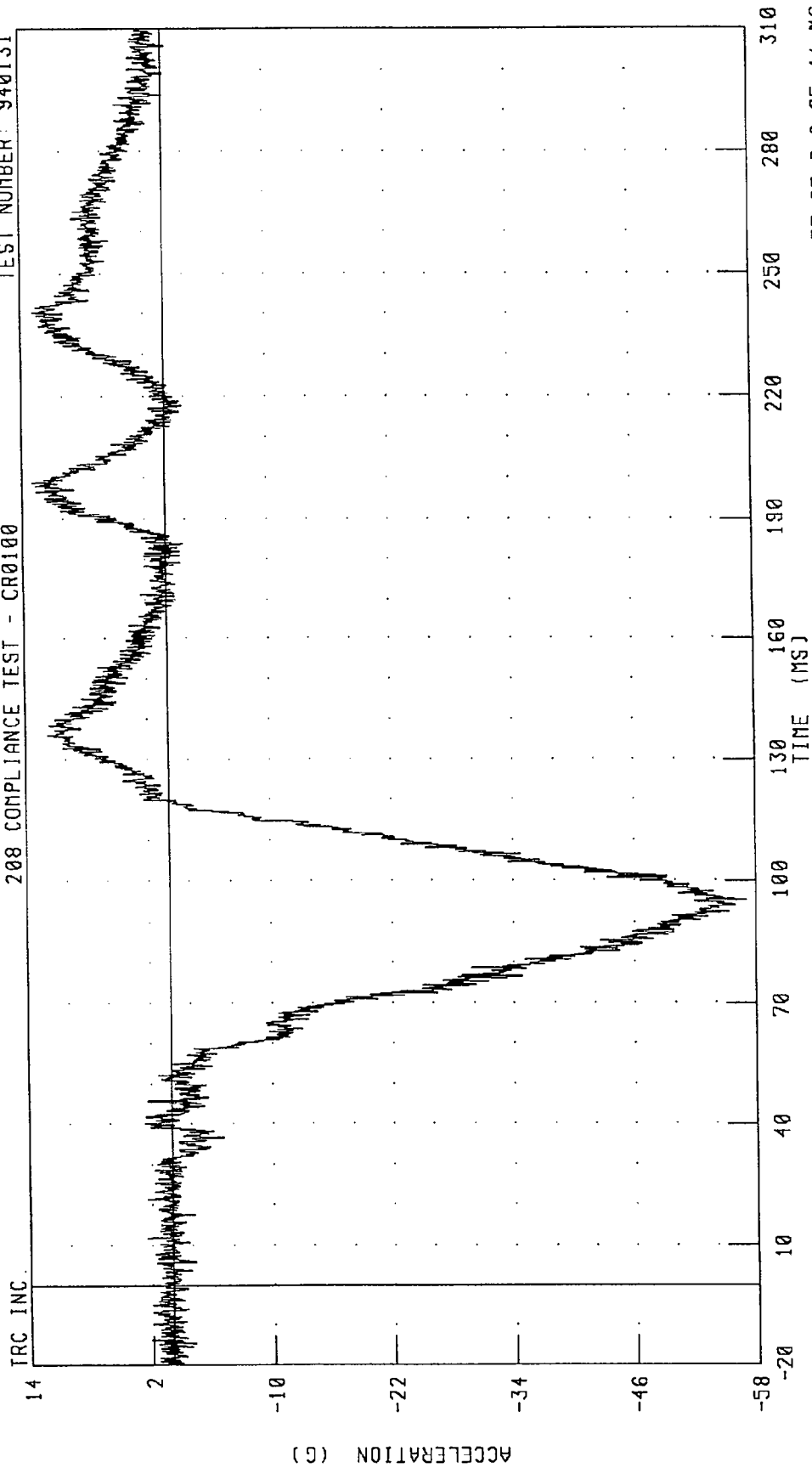
940131

APPENDIX B

DATA PLOTS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 DRIVER HEAD X-AXIS ACCELERATION
 208 COMPLIANCE TEST - CR0100

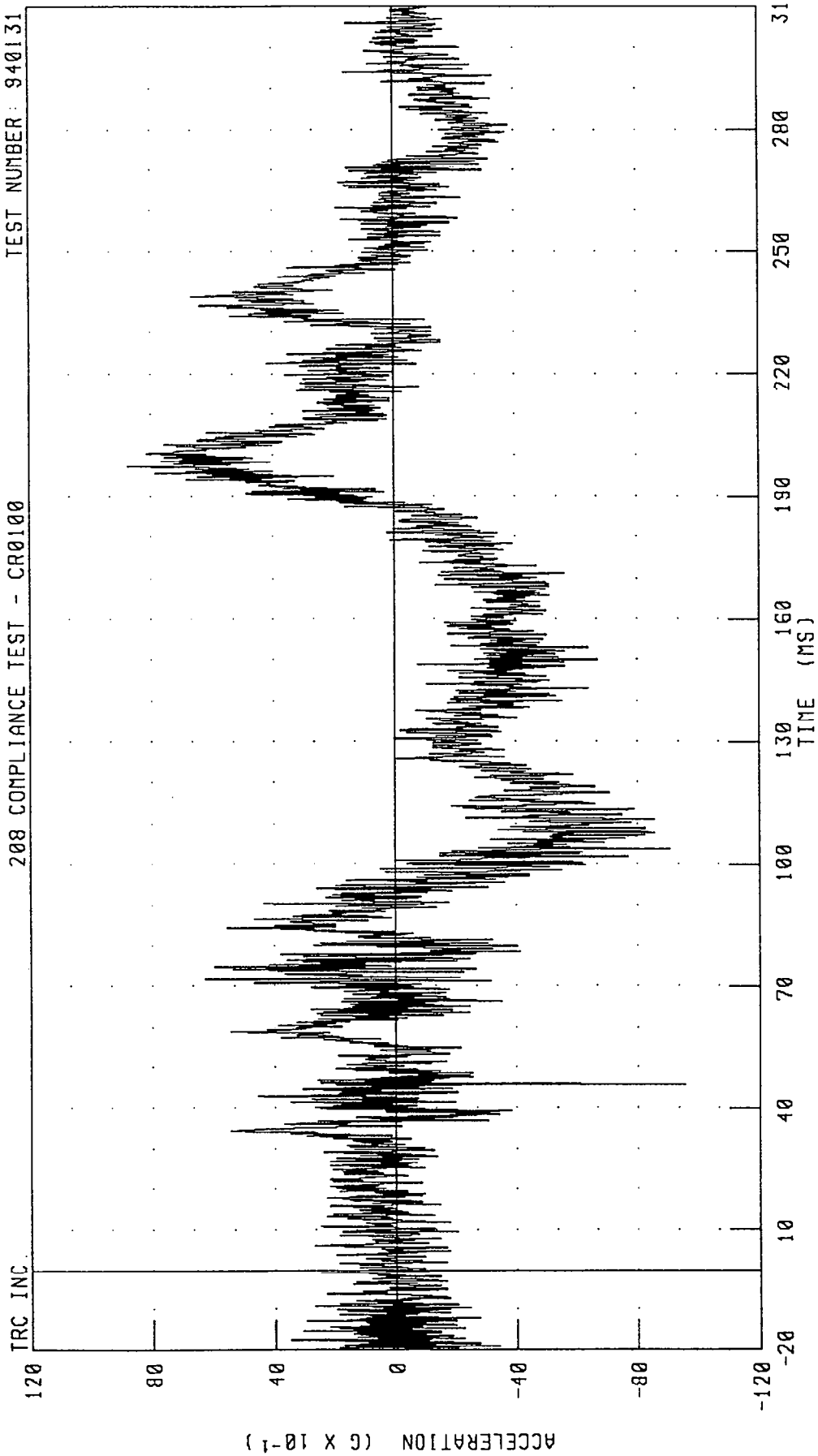
TEST NUMBER: 940131



CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION
 208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

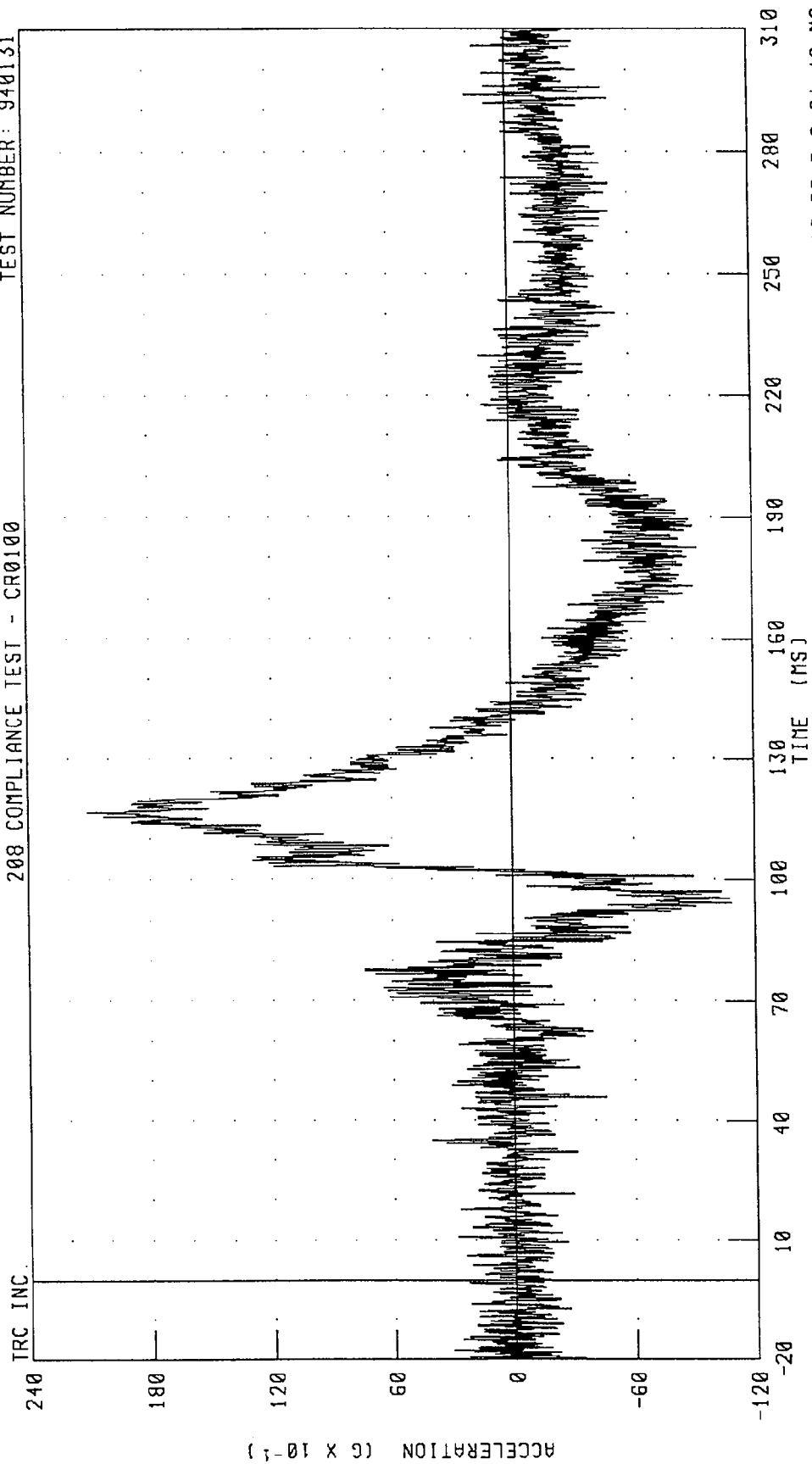


CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

PEAK DATA: 8.74 G @ 197.44 MS; -9.56 G @ 45.84 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 DRIVER HEAD Z-AXIS ACCELERATION
 208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

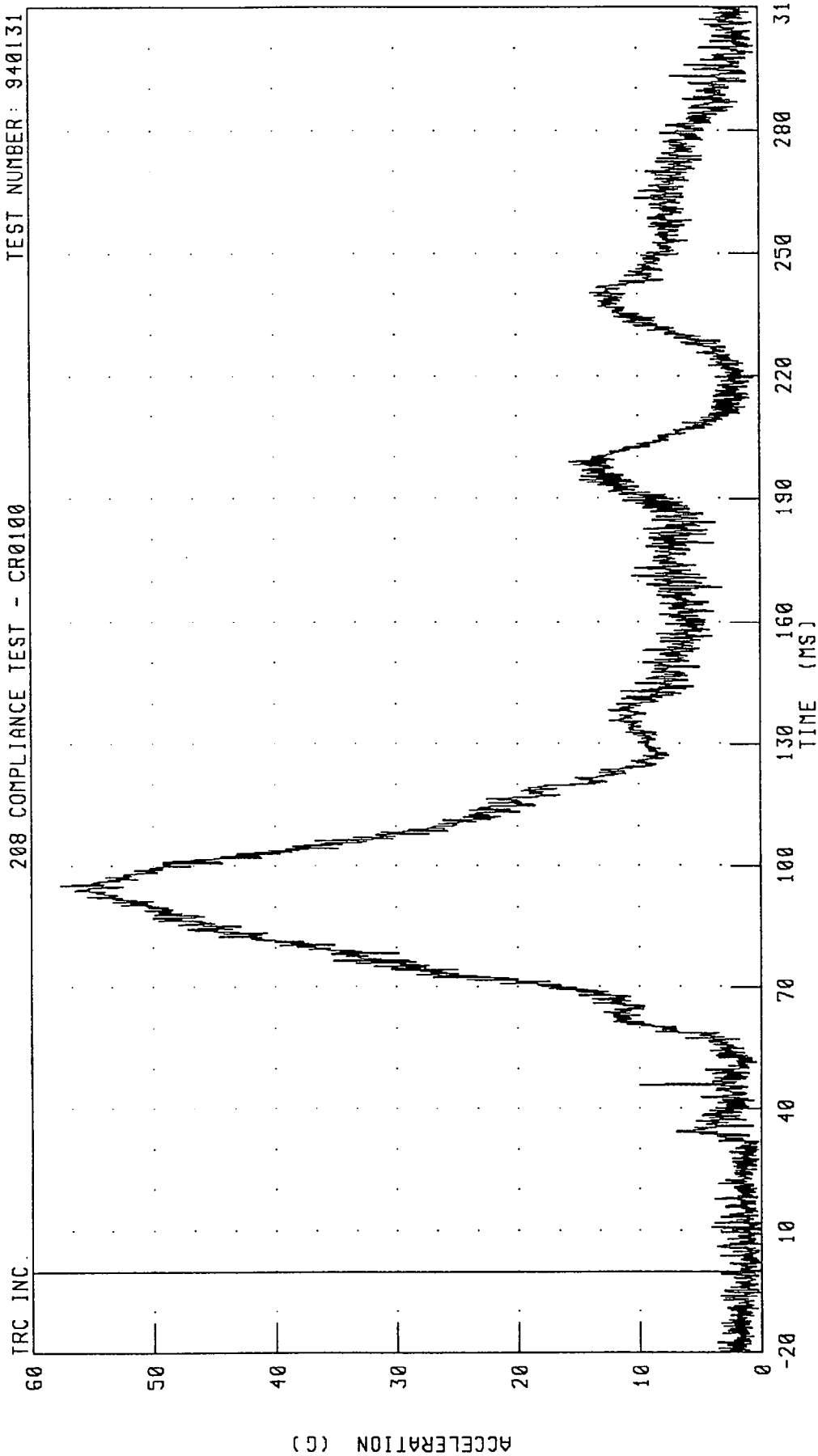


CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100

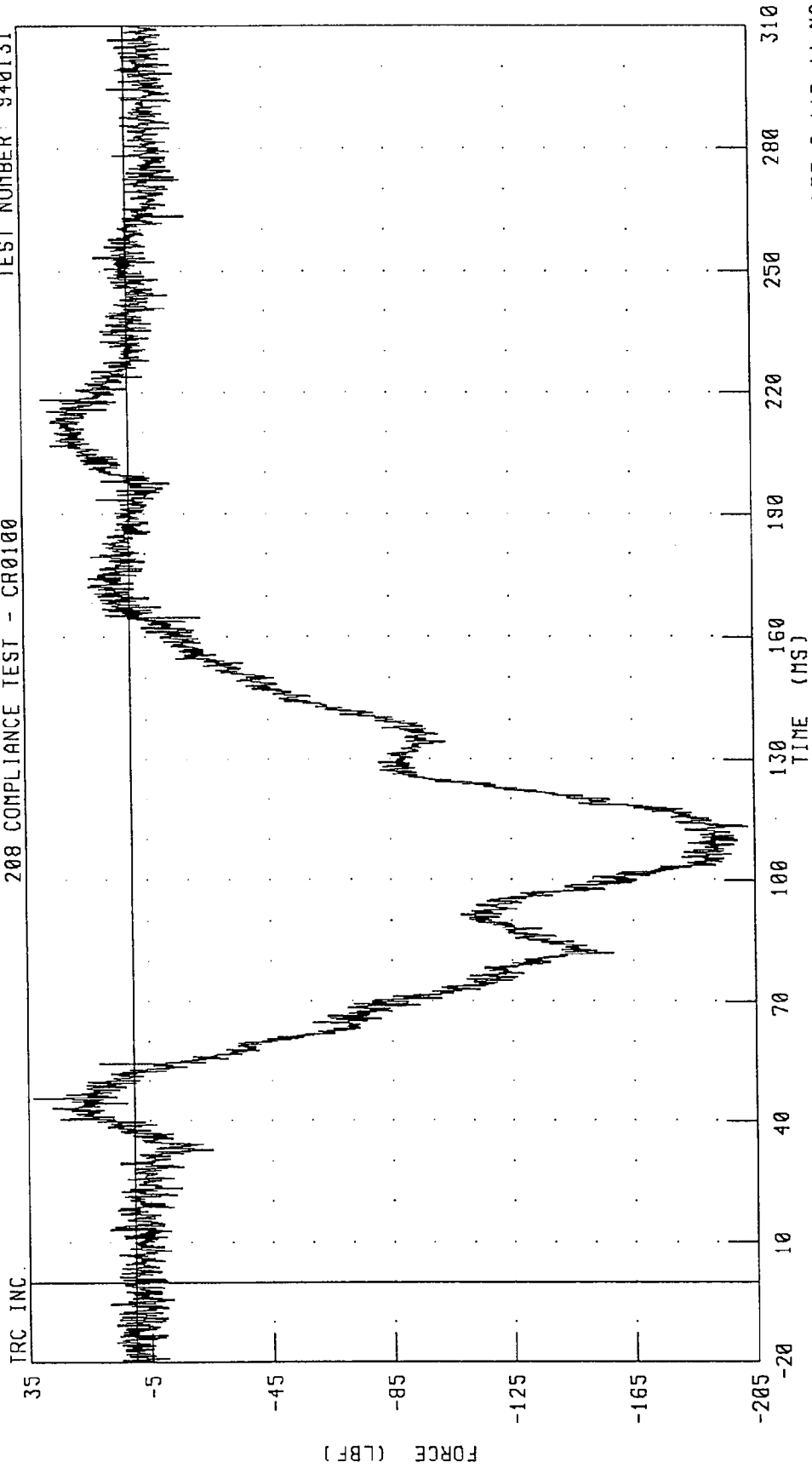


CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 57.62 G @ 95.44 MS; 0.09 G @ -5.28 MS

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
 DRIVER NECK X-AXIS SHEAR FORCE
 200 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



PEAK DATA: 33.22 LBF @ 45.84 MS; -202.36 LBF @ 113.44 MS

CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

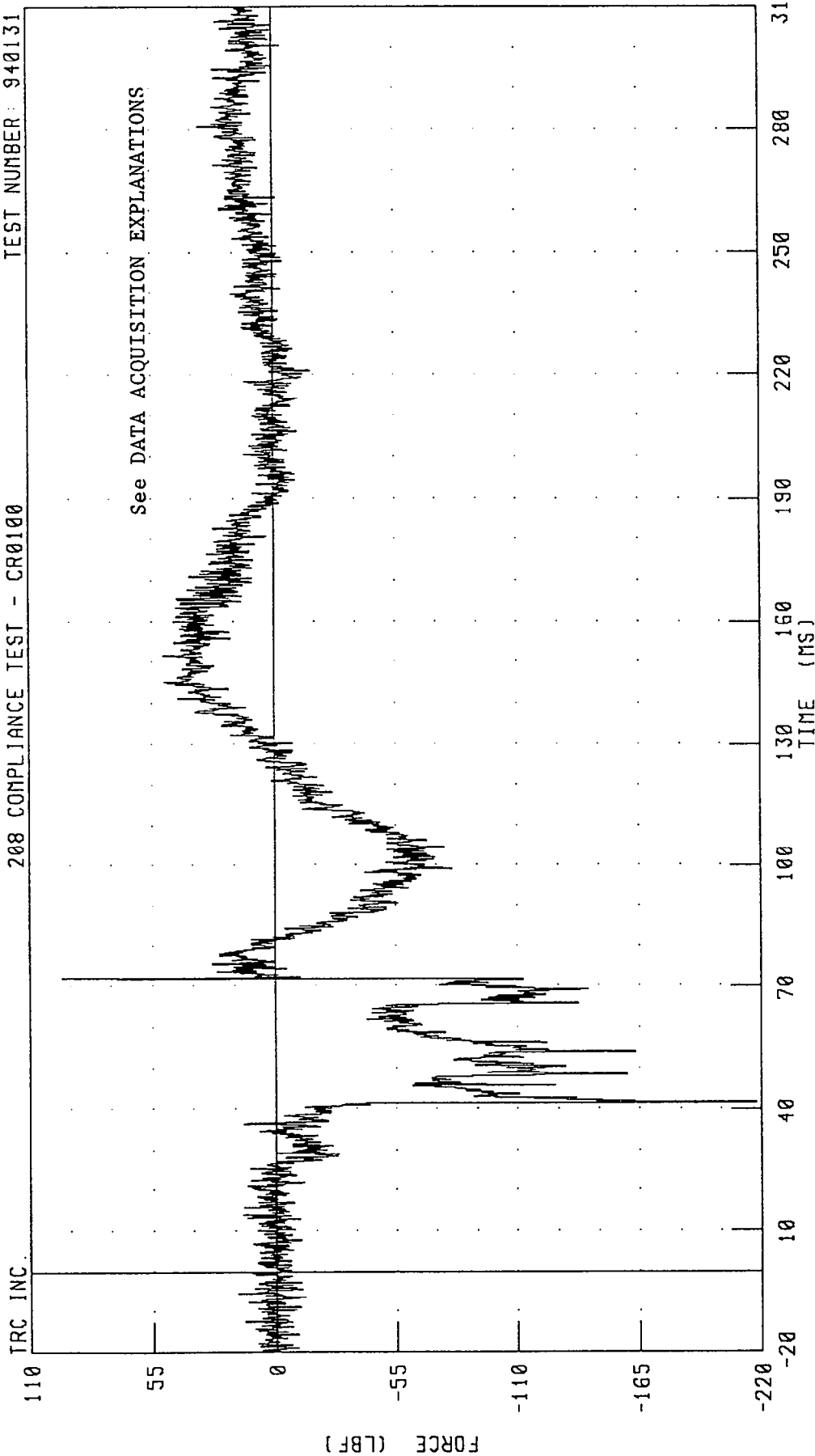
1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER

DRIVER NECK Y-AXIS SHEAR FORCE

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

TRC INC.

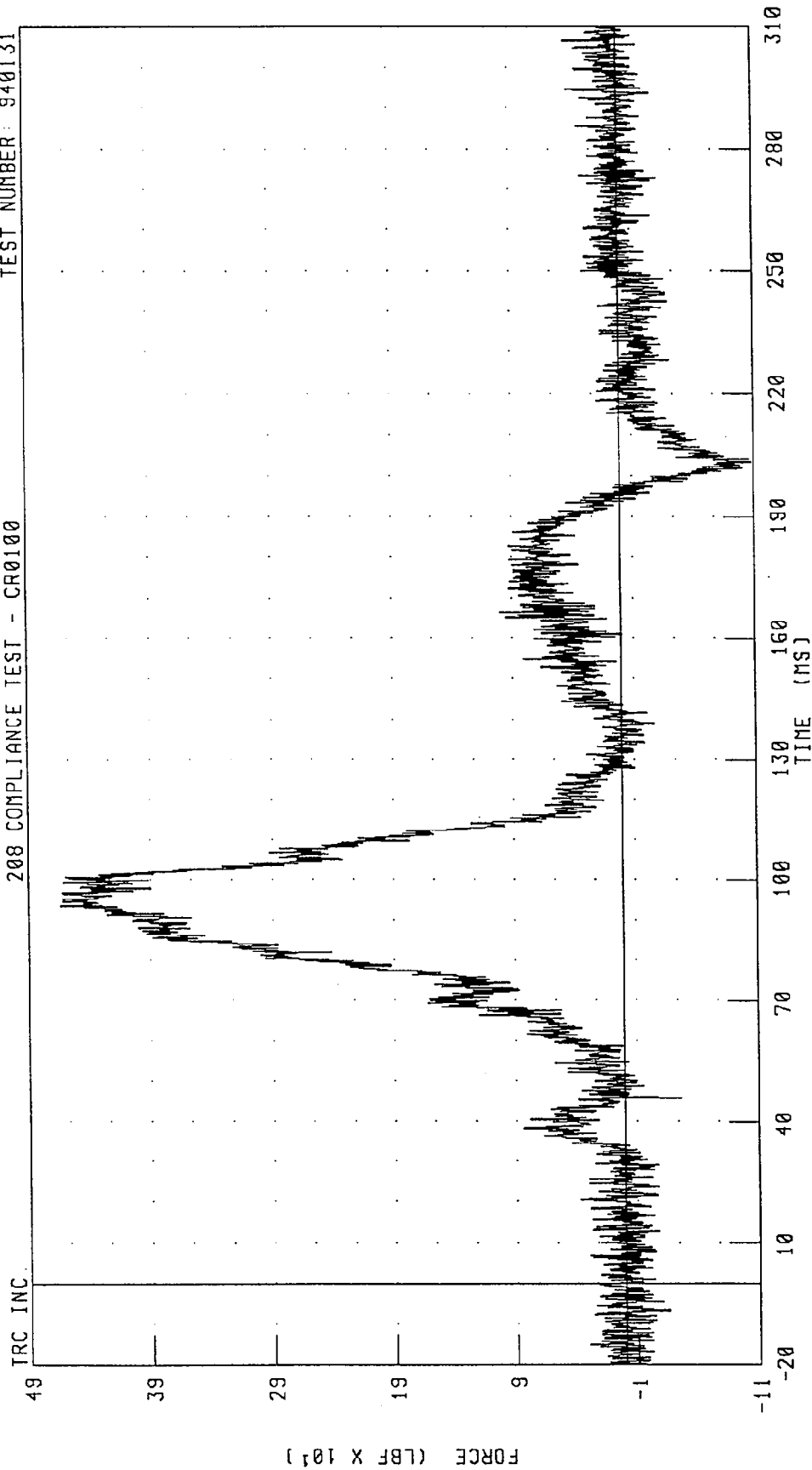


CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

PEAK DATA: 95.40 LBF @ 71.92 MS; -217.51 LBF @ 41.68 MS

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
 DRIVER NECK Z-AXIS AXIAL FORCE
 208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

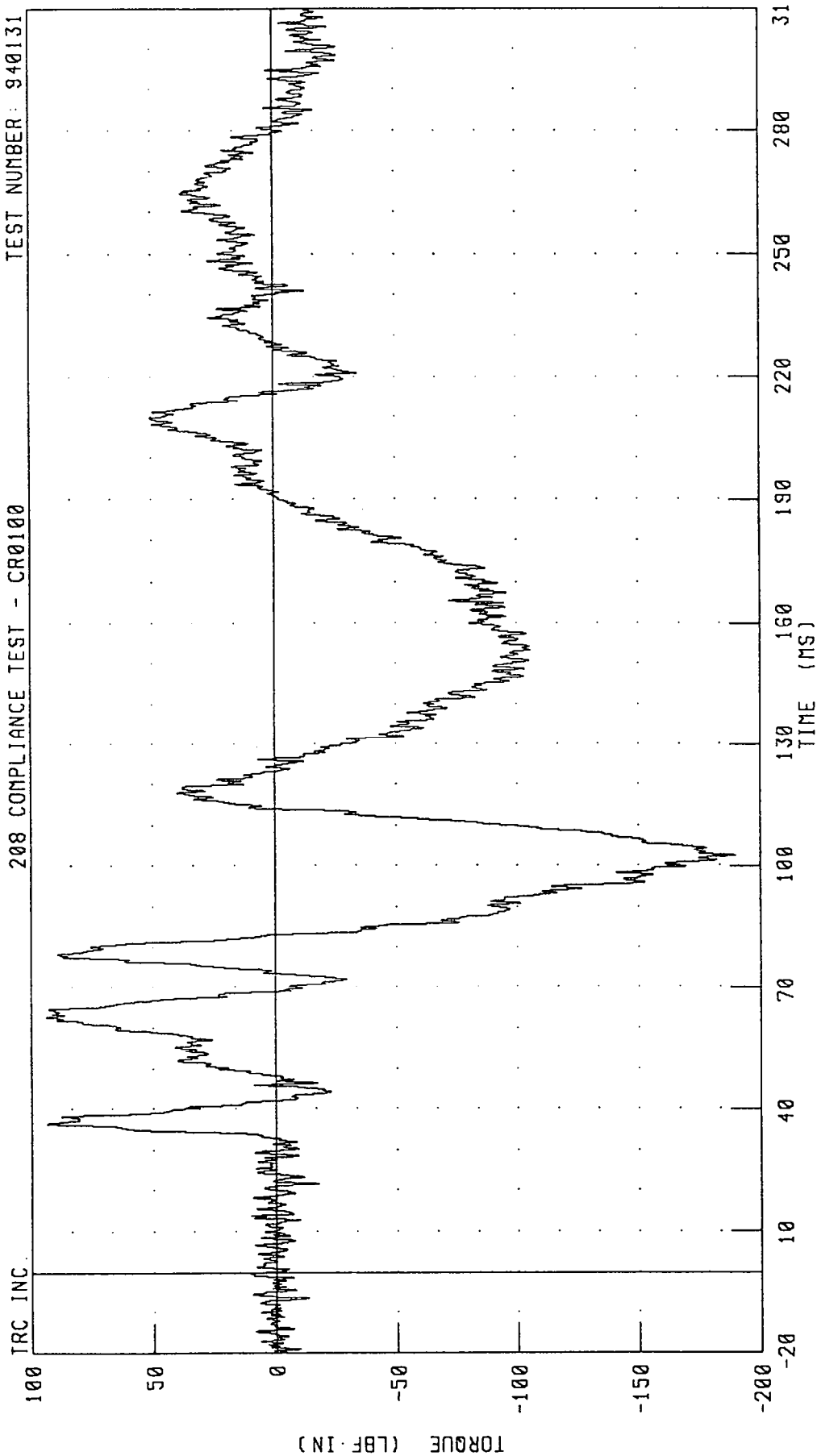


CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

PEAK DATA: 463.34 LBF @ 93.68 MS; -107.90 LBF @ 203.44 MS

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
 DRIVER NECK MOMENT ABOUT X AXIS
 208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



PEAK DATA: 93.62 LBF-IN @ 62.72 MS; -189.87 LBF-IN @ 102.56 MS

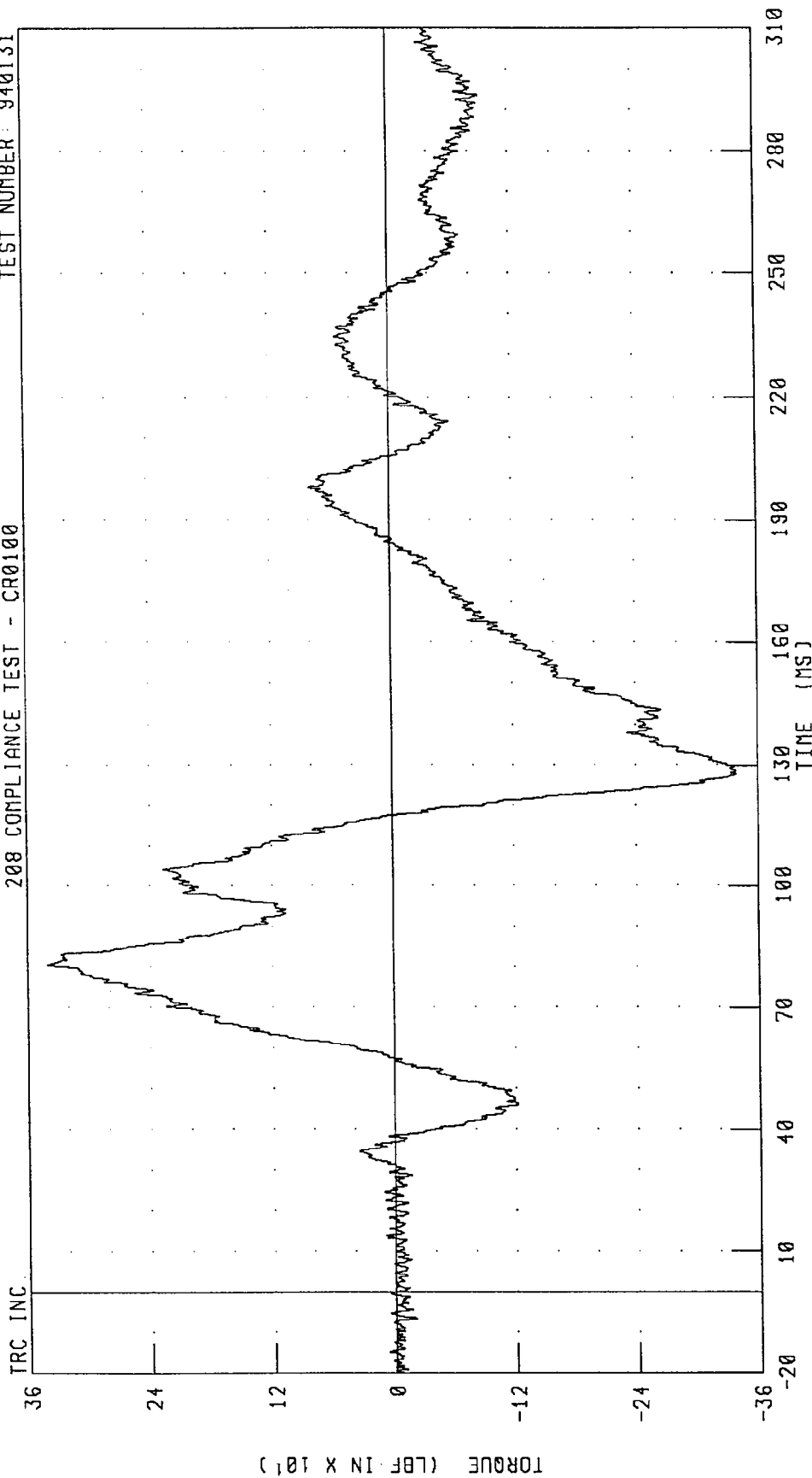
CHANNEL: NEKXMI FILTER: CH. CLASS 600

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER

DRIVER NECK MOMENT ABOUT Y AXIS

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



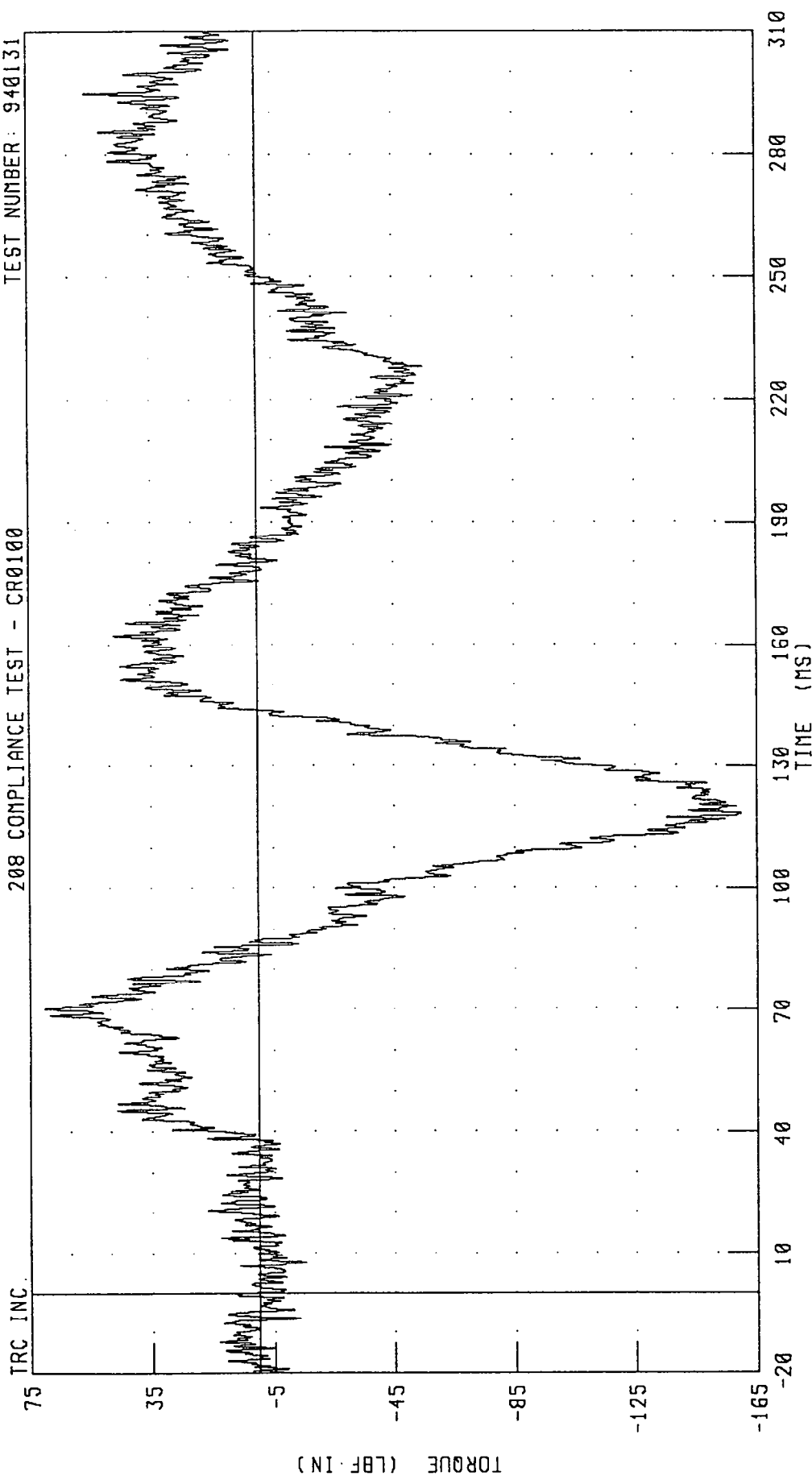
CHANNEL: NEKYM1 FILTER: CH. CLASS 600

PEAK DATA: 340.05 LBF·IN @ 80.48 MS; -338.10 LBF·IN @ 128.64 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 DRIVER NECK MOMENT ABOUT Z AXIS

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

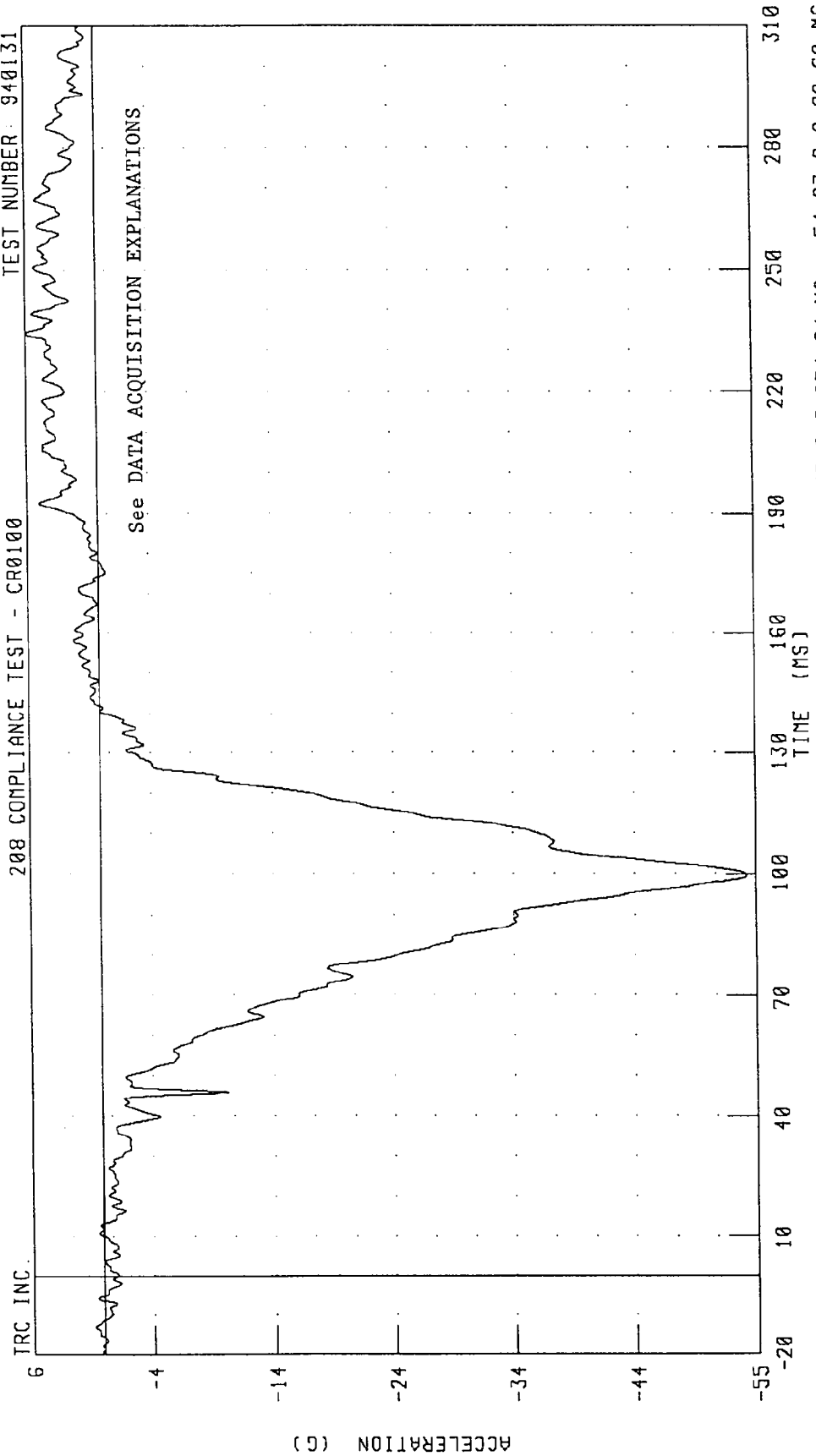


PEAK DATA: 70.28 LBF-IN @ 70.24 MS; -159.92 LBF-IN @ 118.32 MS

CHANNEL: NEKZM1 FILTER: CH. CLASS 600

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 DRIVER CHEST X-AXIS ACCELERATION
 208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

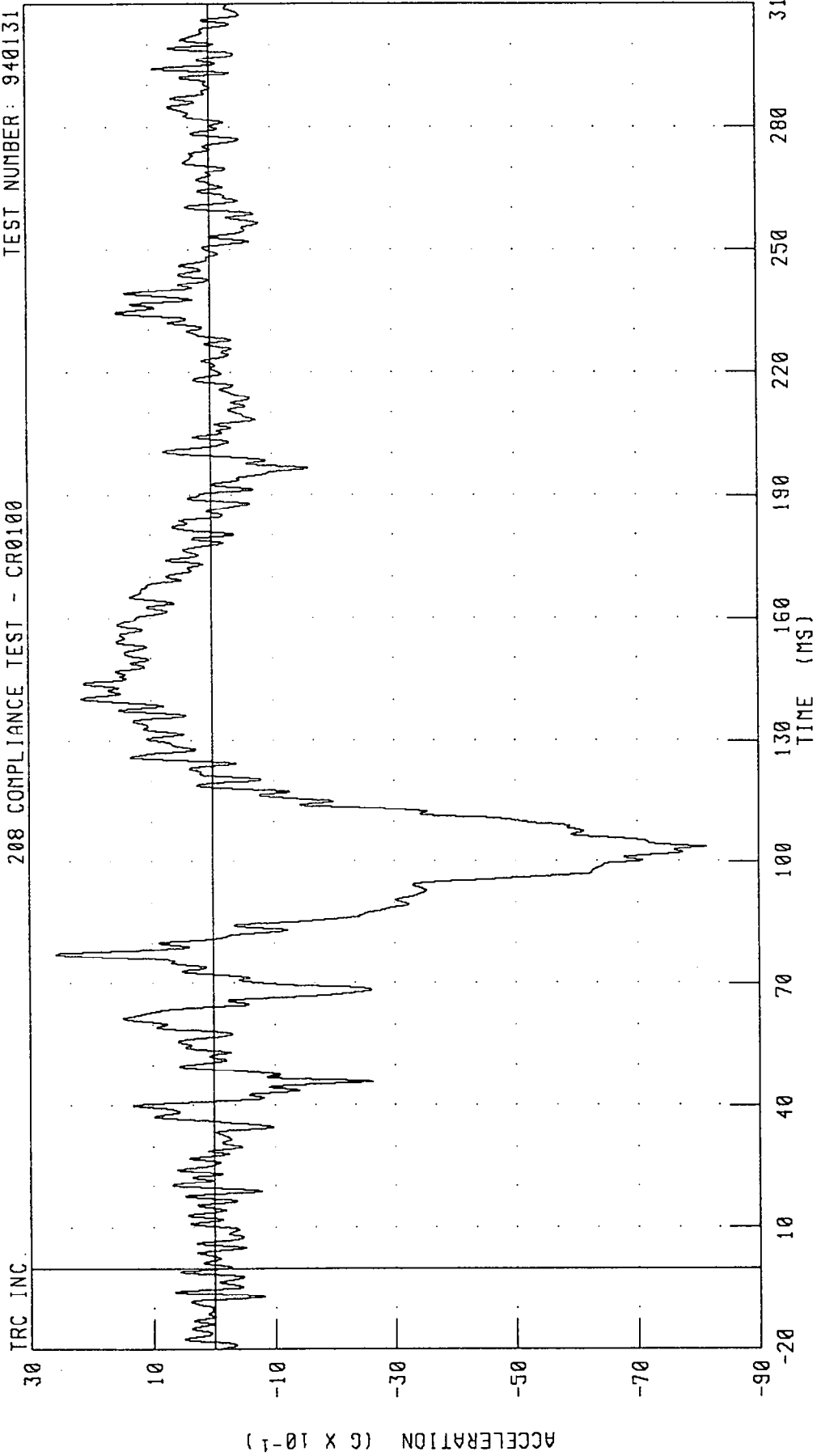


PEAK DATA: 5.97 G @ 234.24 MS; -54.23 G @ 99.60 MS

CHANNEL: CSTXG1 FILTER: CH. CLASS 180

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION
 208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

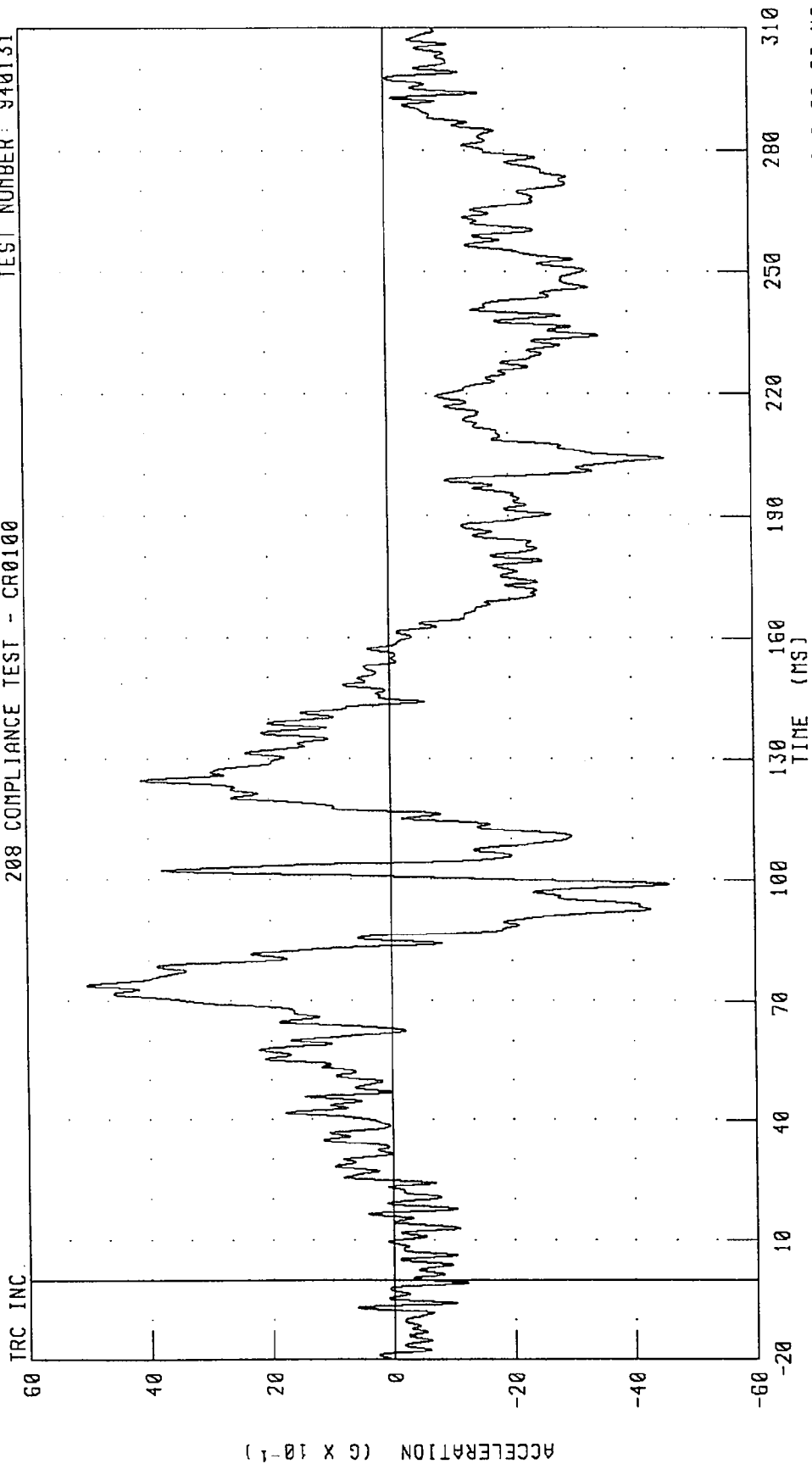


CHANNEL: CSTYG1 FILTER: CH. CLASS 180

940131

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 DRIVER CHEST Z-AXIS ACCELERATION
 208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

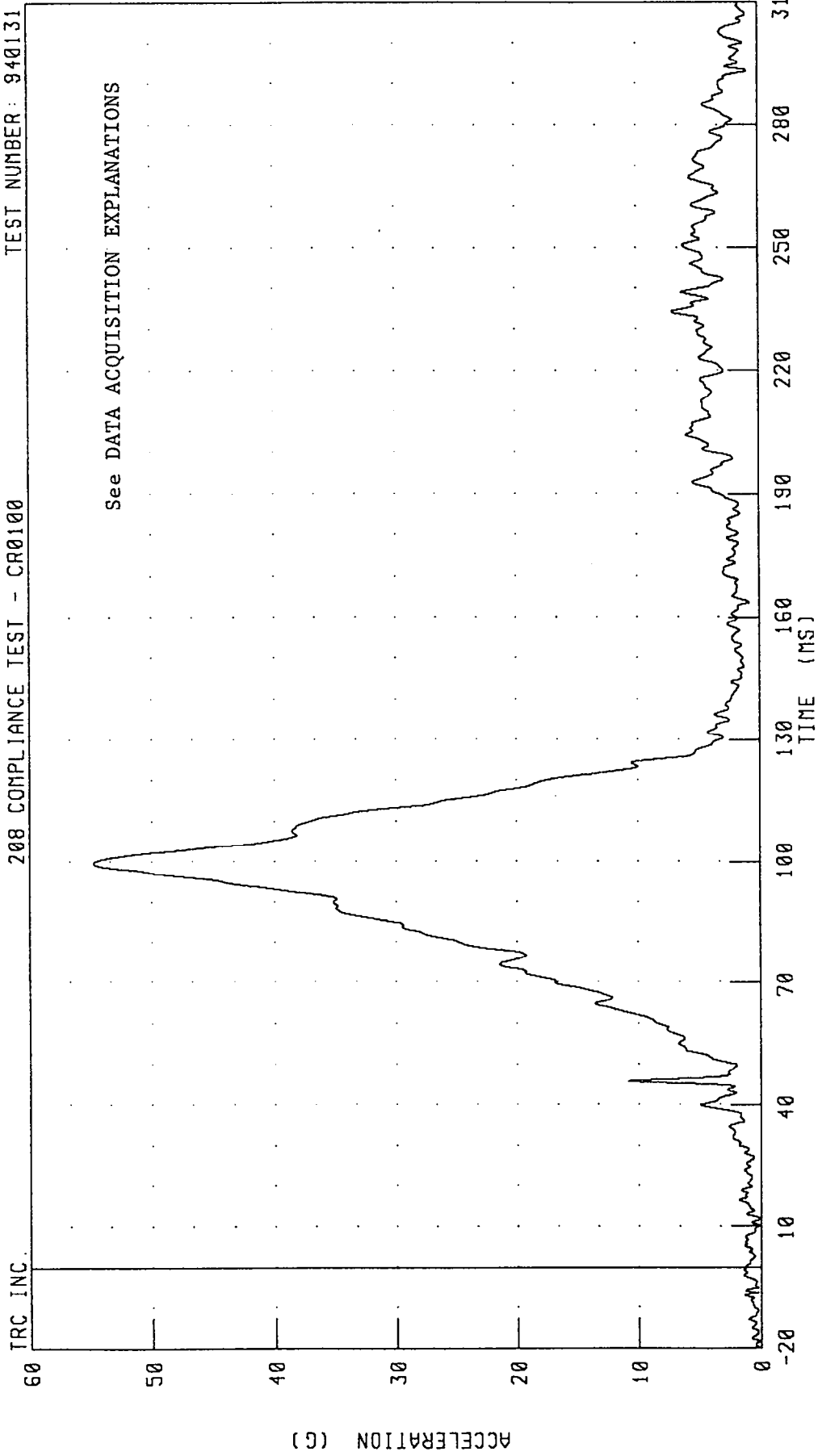


CHANNEL: CSTZG1 FILTER: CH. CLASS 180

PEAK DATA: 5.02 G @ 74.00 MS; -4.59 G @ 98.88 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



CHANNEL: CSTRG1 FILTER: CH. CLASS 180

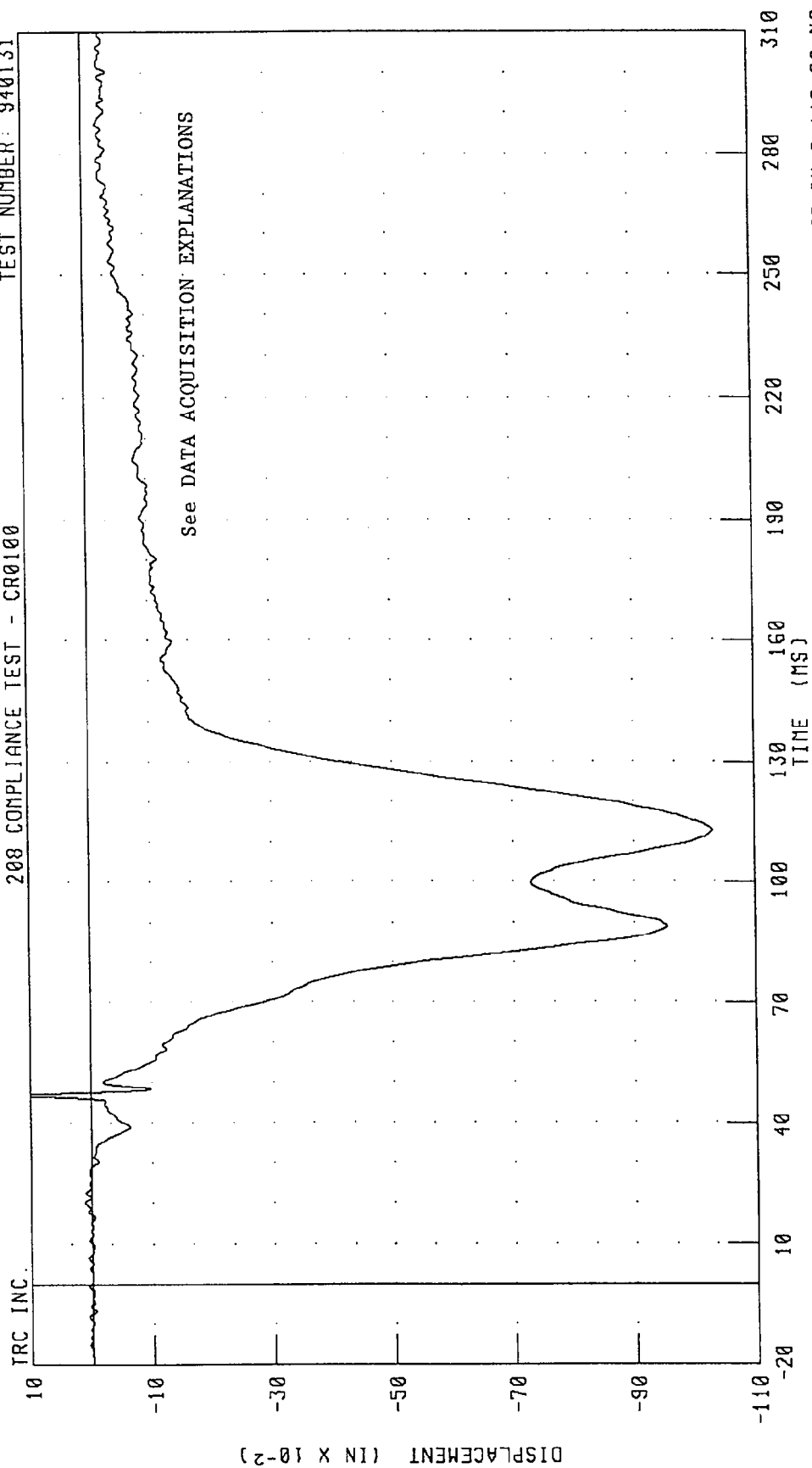
PEAK DATA: 54.73 G @ 99.60 MS; 0.09 G @ -18.24 MS

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER

DRIVER CHEST DEFLECTION

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



CHANNEL: CSTX01 FILTER: CH. CLASS 180

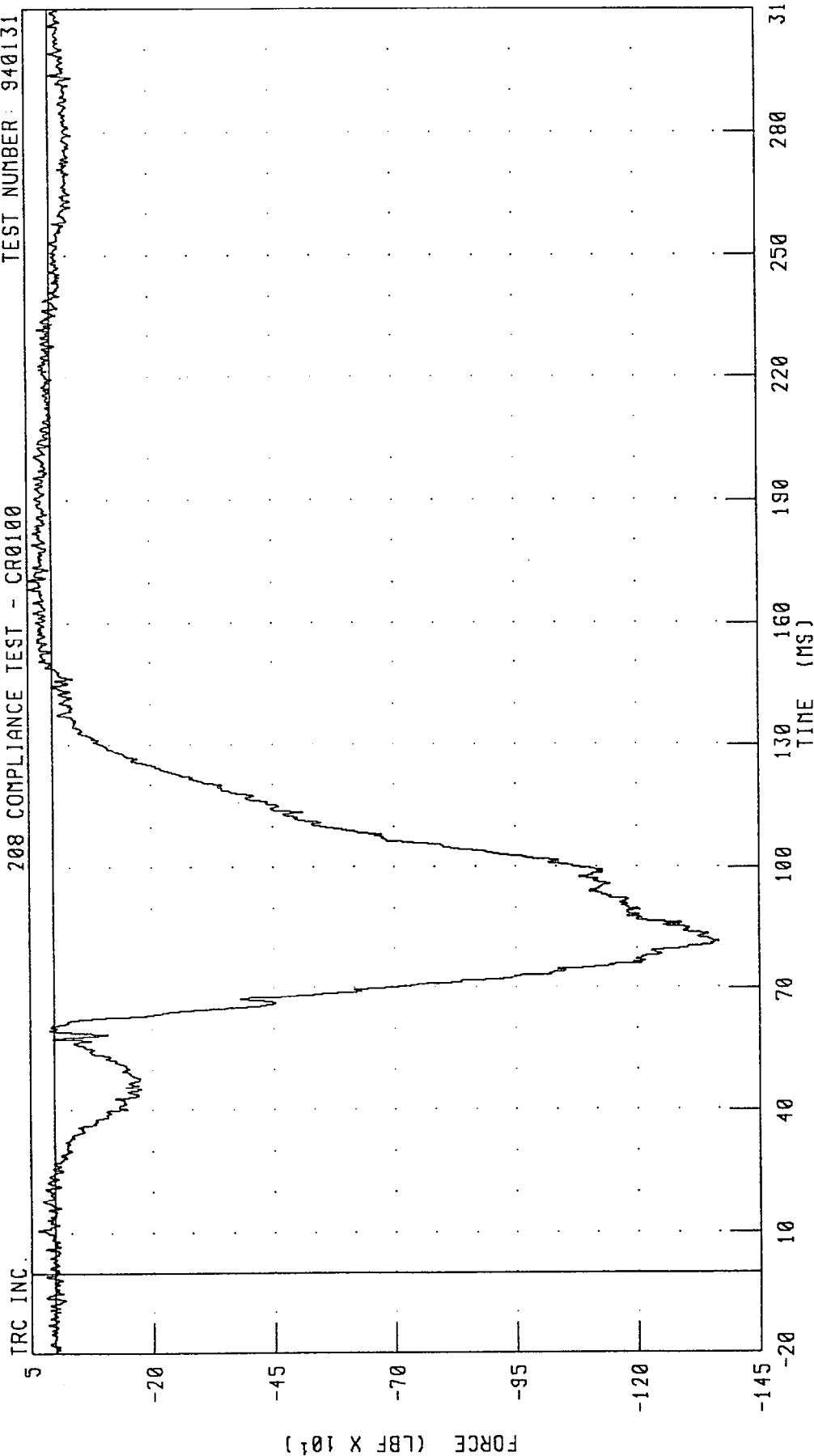
PEAK DATA: 0.13 IN @ 47.04 MS; -1.03 IN @ 112.96 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER

DRIVER LEFT FEMUR FORCE

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



CHANNEL: LFMFI FILTER: CH. CLASS 600

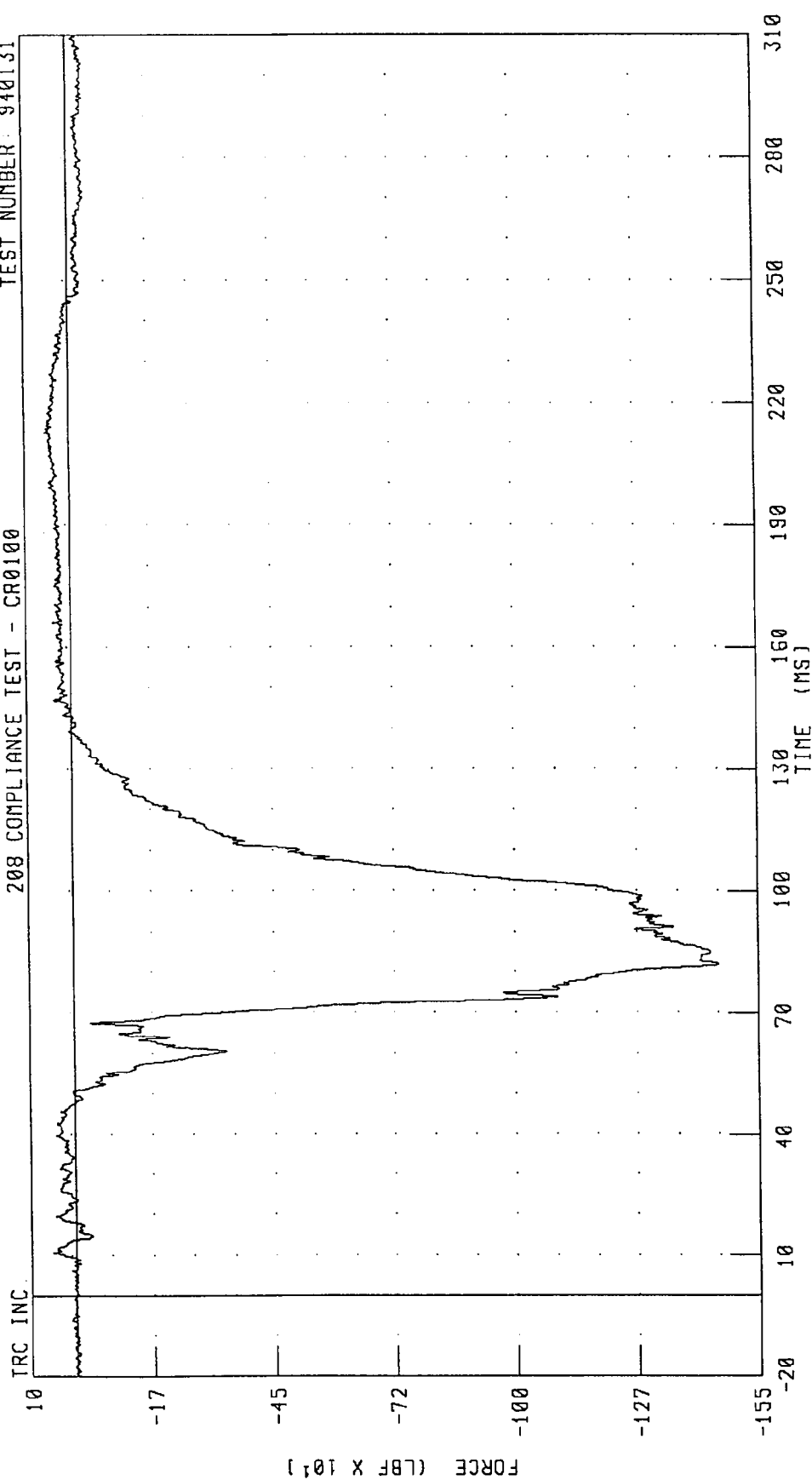
PEAK DATA: 47.47 LBF @ 170.80 MS; -1366.86 LBF @ 81.68 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER

DRIVER RIGHT FEMUR FORCE

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



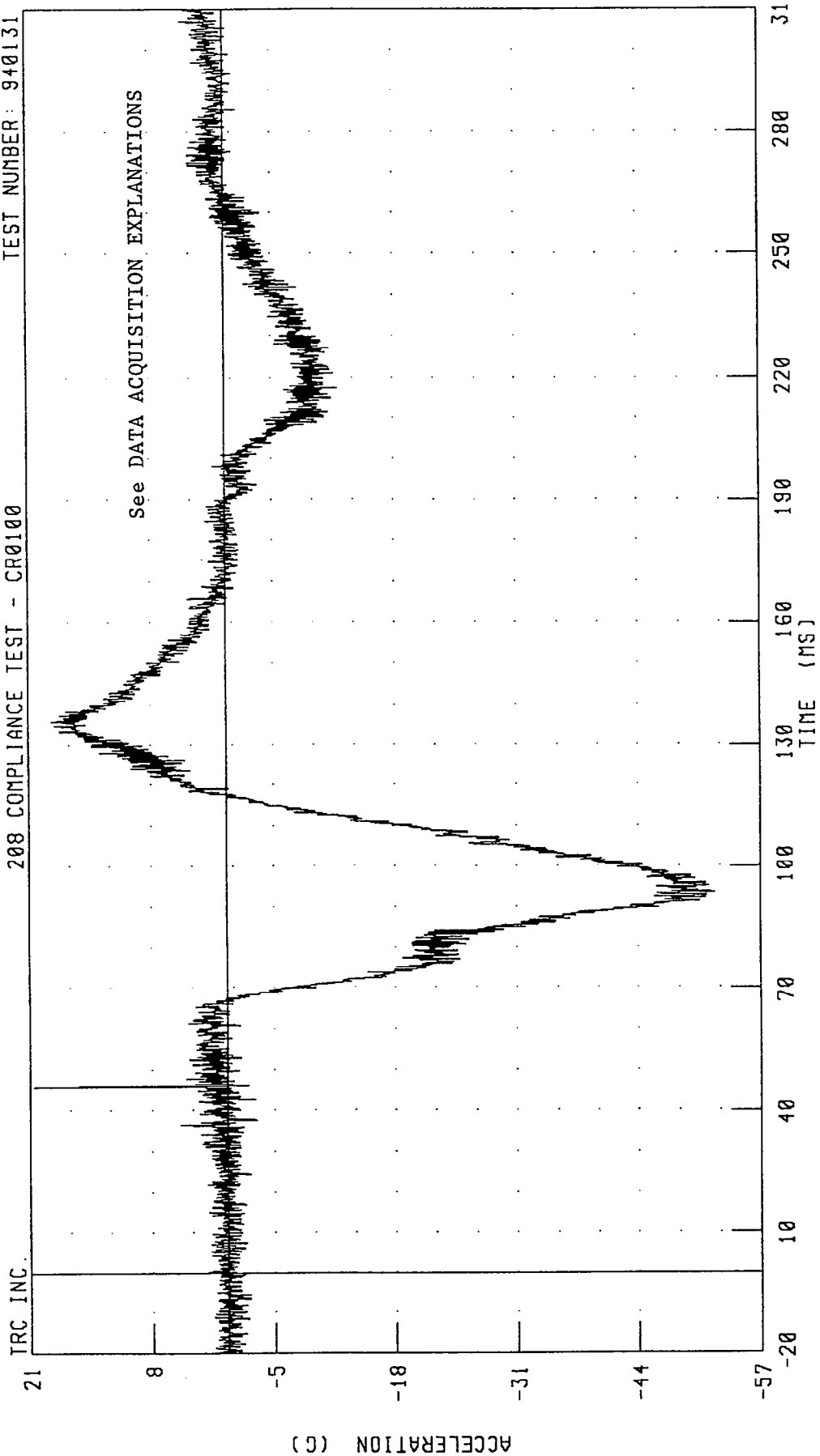
PEAK DATA: 52.09 LBF @ 212.80 MS; -1458.36 LBF @ 81.68 MS

CHANNEL: RFMF1 FILTER: CH. CLASS 600

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100



CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

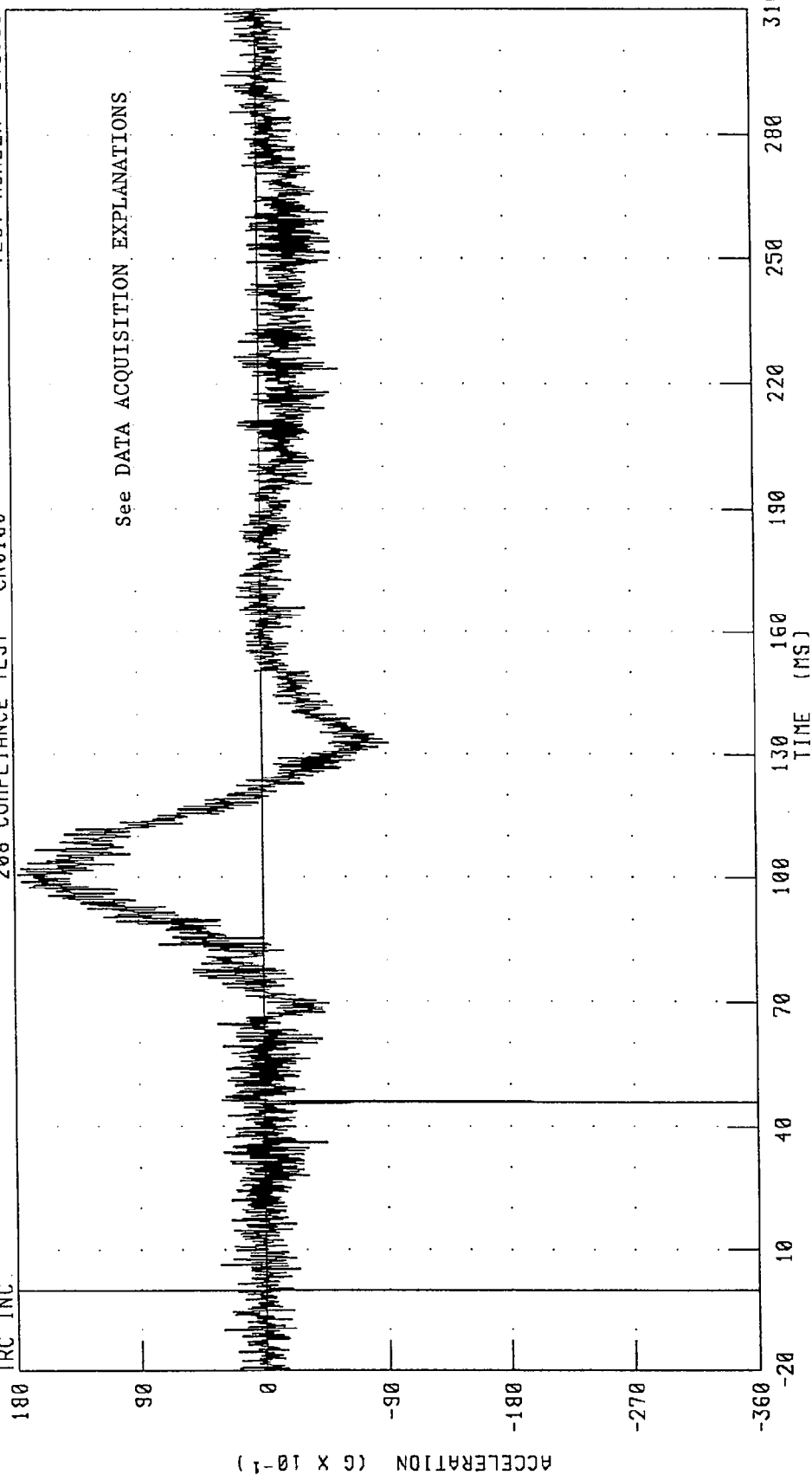
PEAK DATA: 20.54 G @ 45.92 MS; -52.11 G @ 93.36 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100

TRC INC.



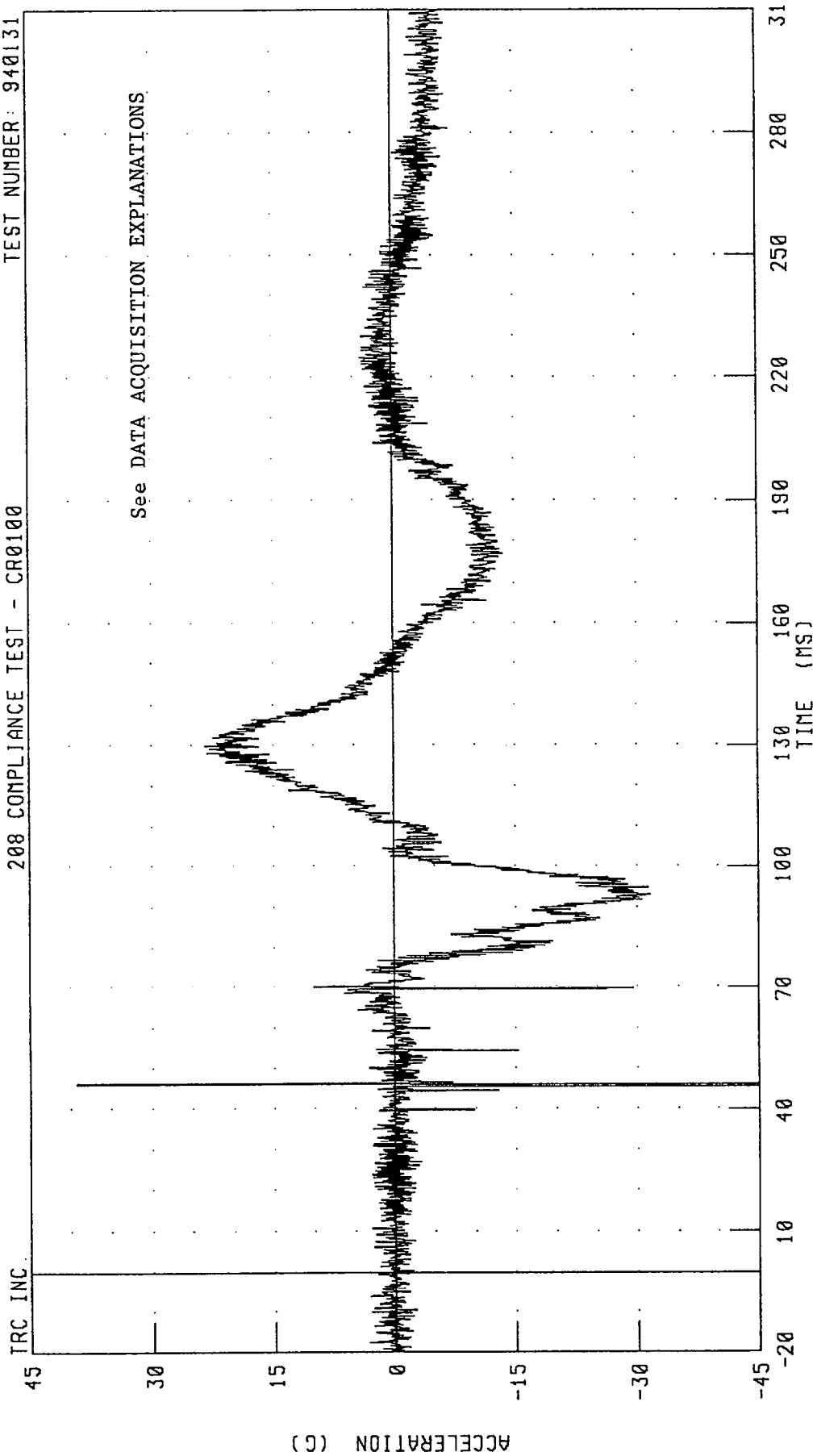
PEAK DATA: 17.72 G @ 100.72 MS; -35.82 G @ 45.84 MS

CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100



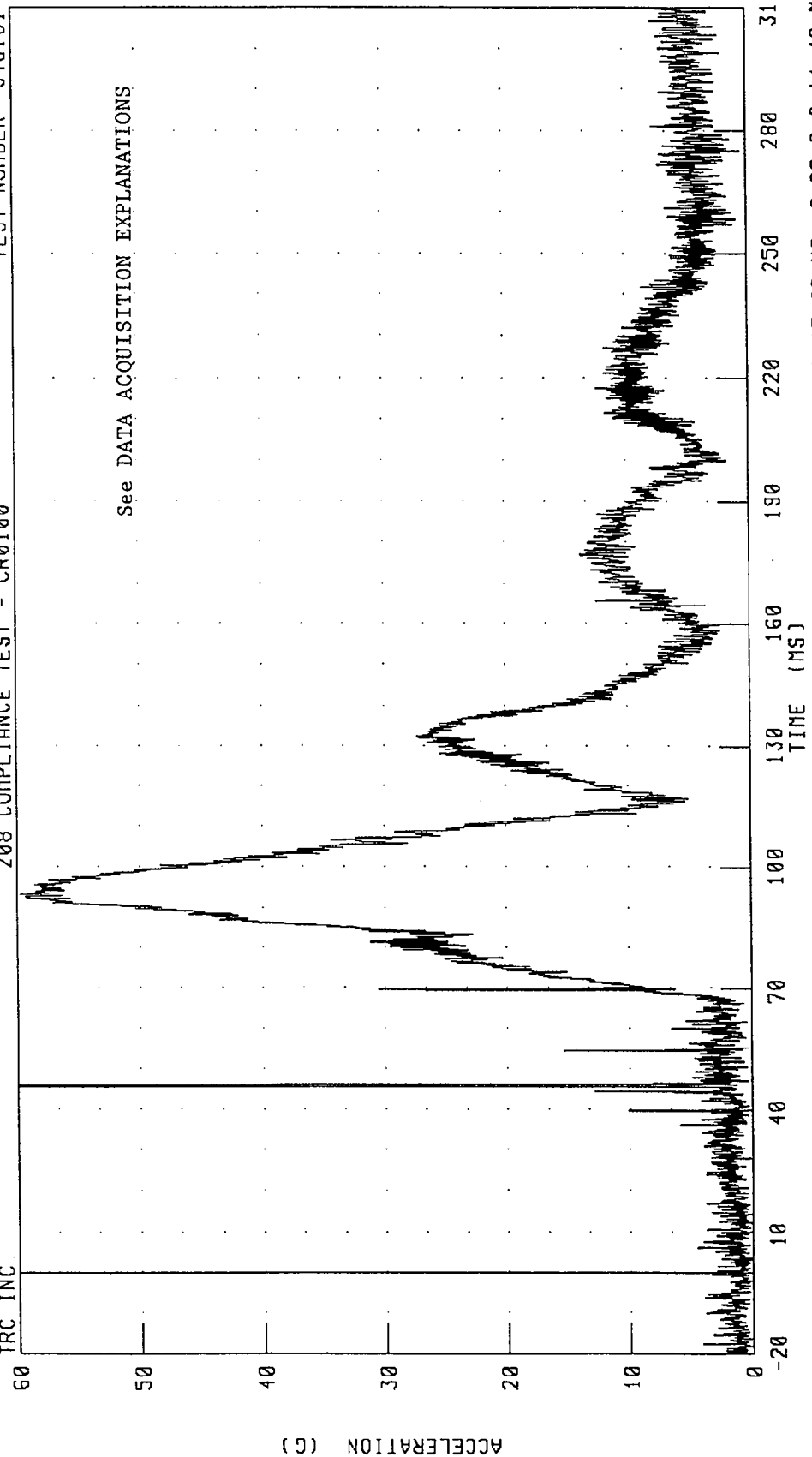
CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100

TRC INC.



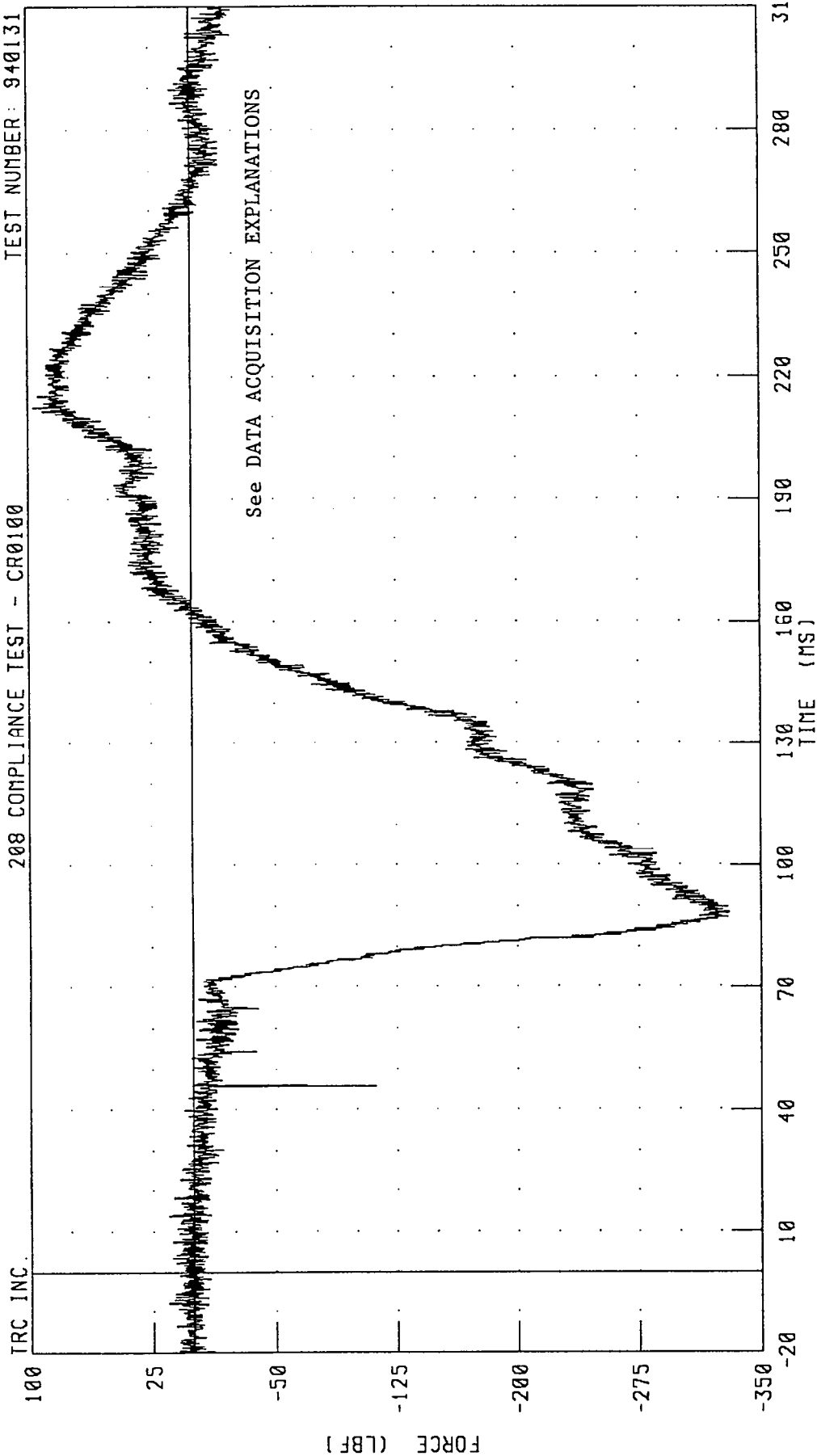
PEAK DATA: 345.69 G @ 45.92 MS; 0.06 G @ 14.40 MS

CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

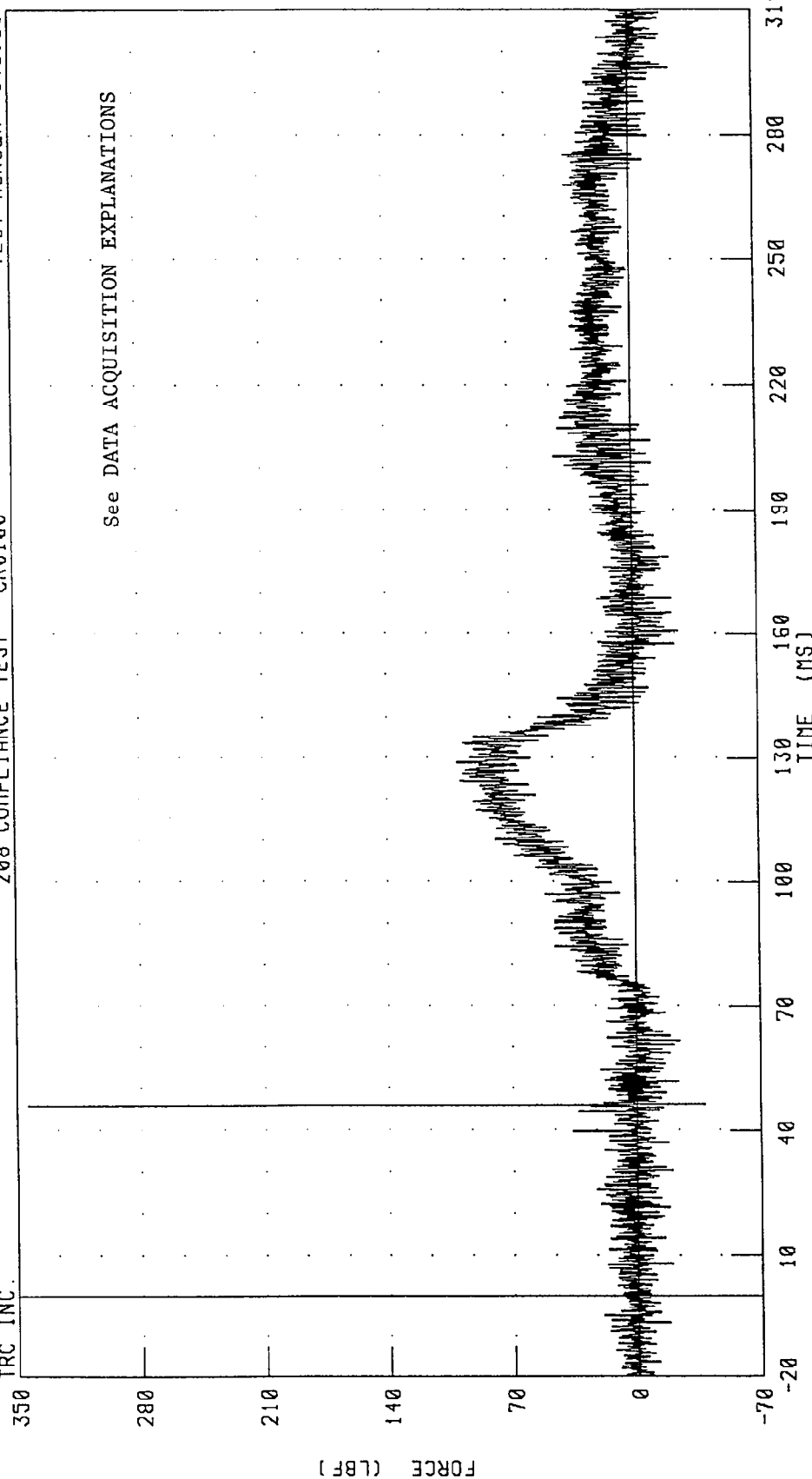
PEAK DATA: 96.64 LBF @ 212.48 MS; -330.20 LBF @ 88.40 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100

TRC INC.



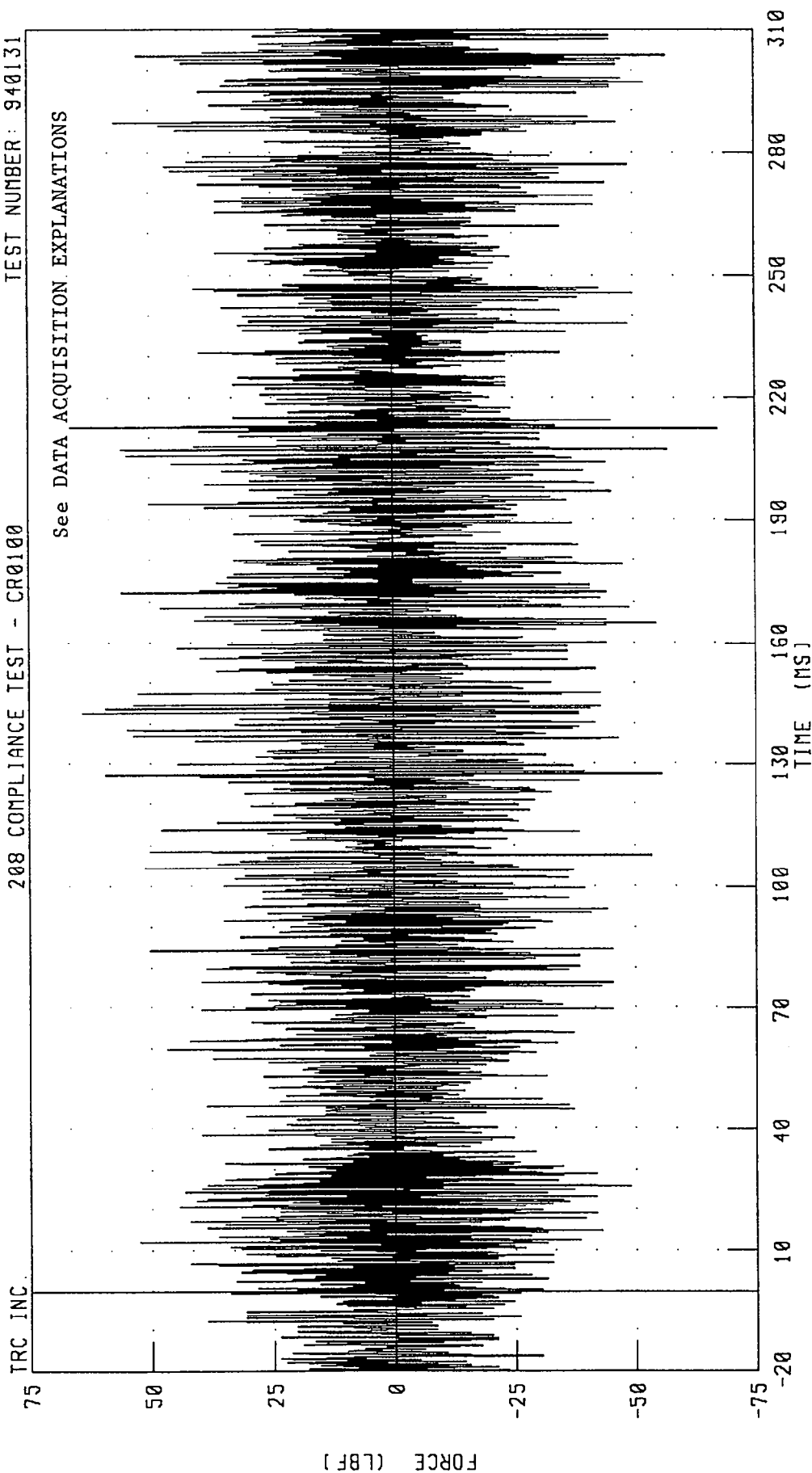
PEAK DATA: 343.90 LBF @ 45.92 MS; -38.12 LBF @ 46.24 MS

CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



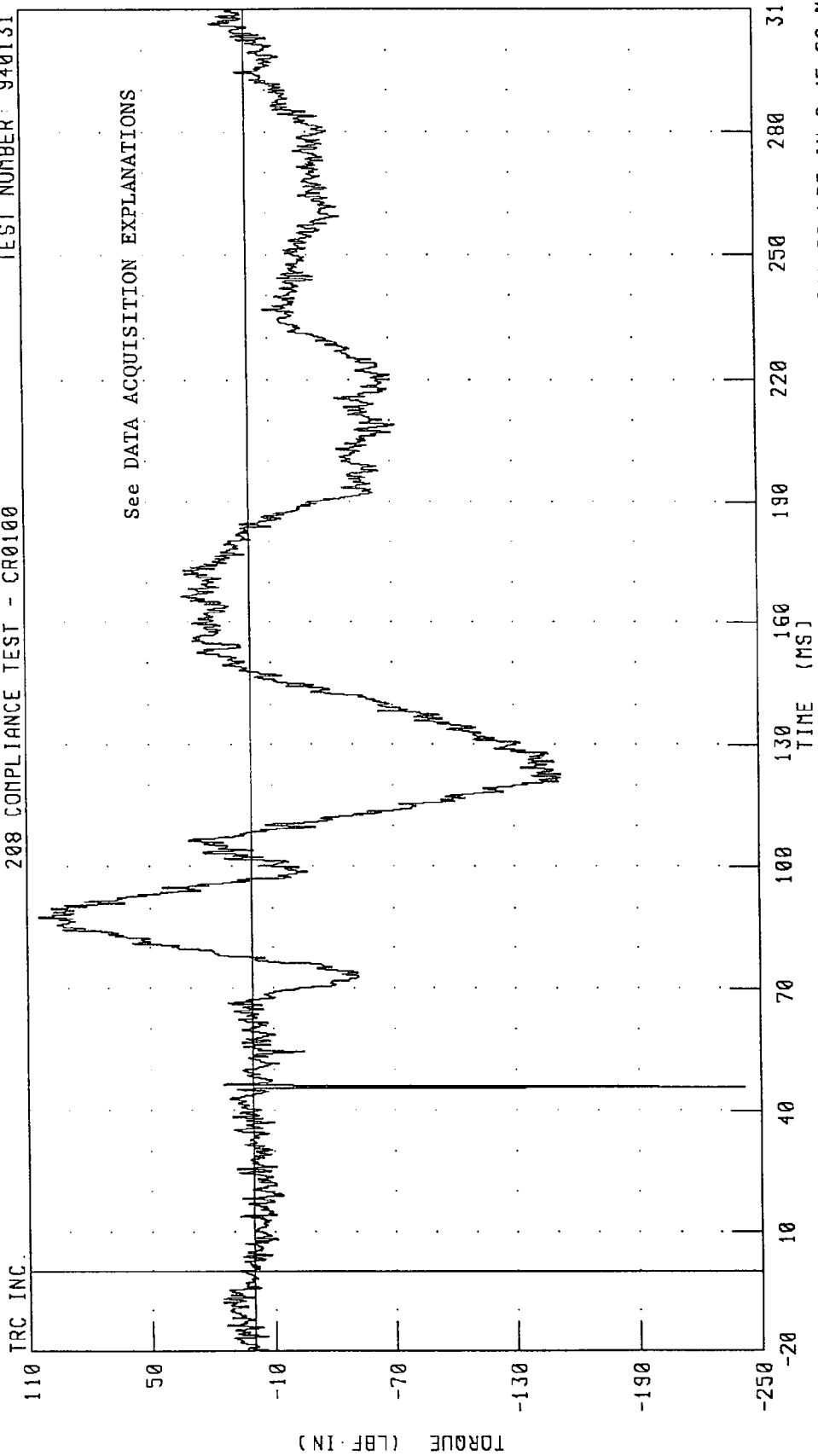
CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

PEAK DATA: 66.28 LBF @ 212.56 MS; -67.22 LBF @ 212.32 MS

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK MOMENT ABOUT X AXIS

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100

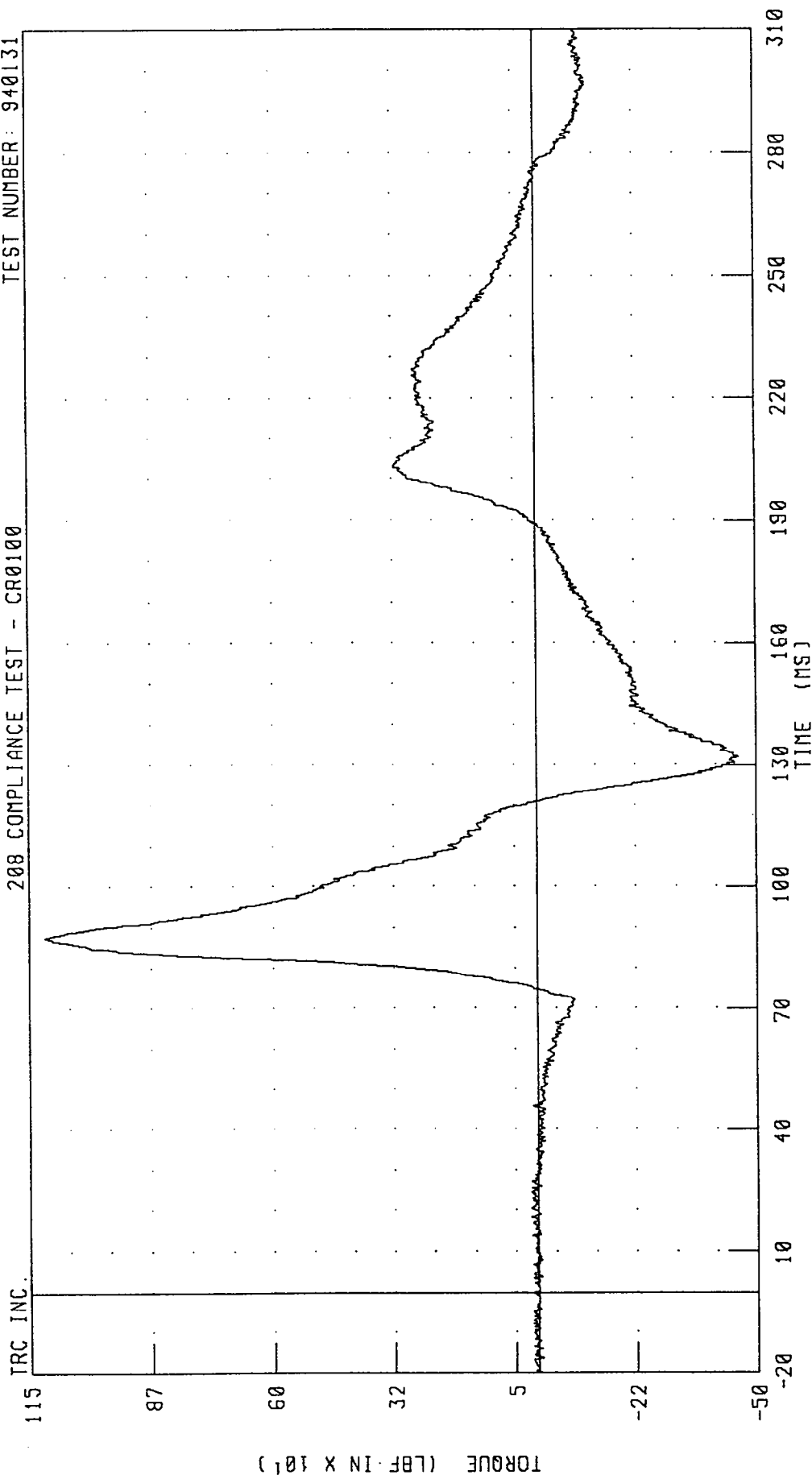


CHANNEL: NEKX12 FILTER: CH. CLASS 600

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



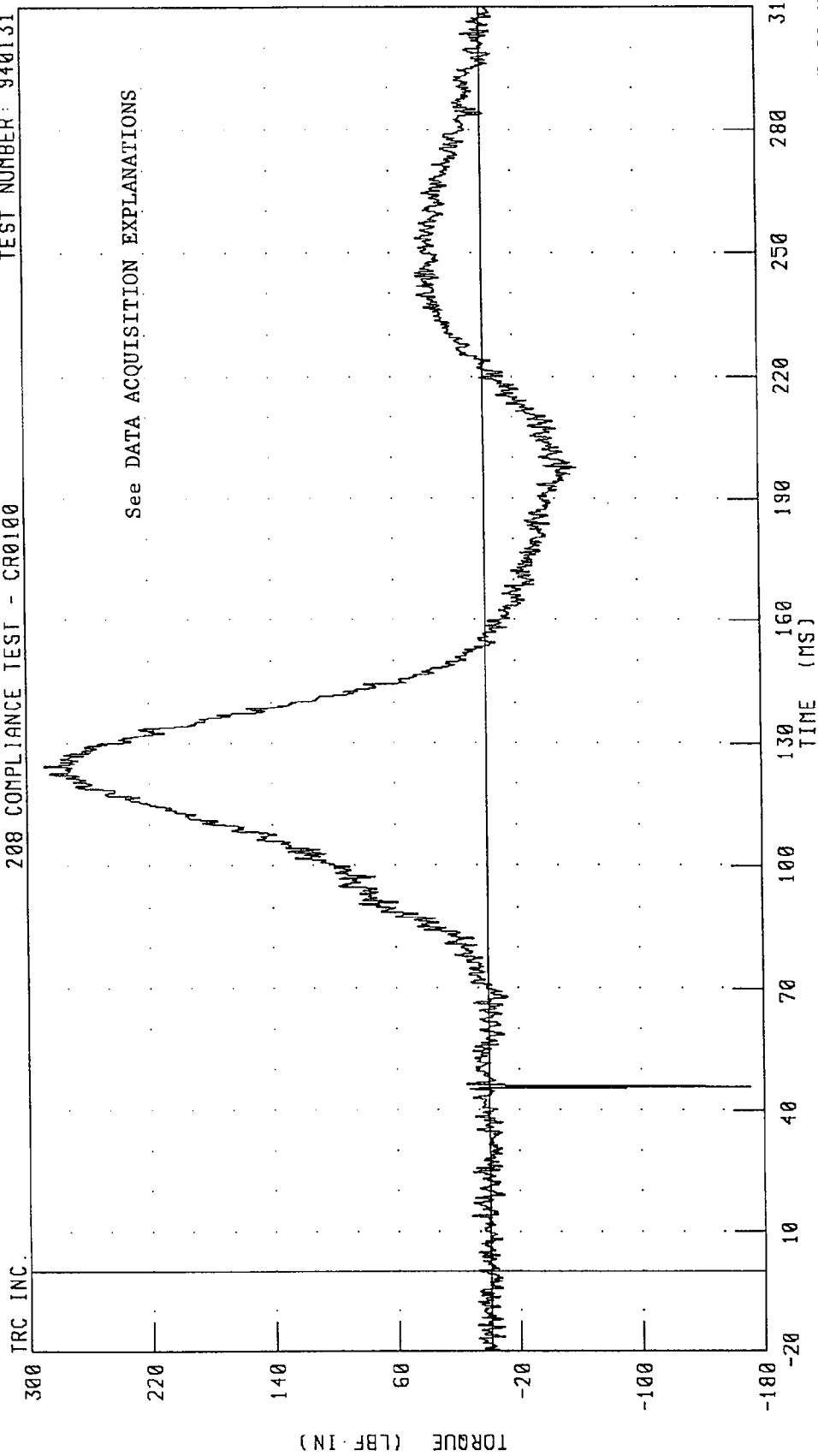
PEAK DATA: 1113.83 LBF-IN @ 87.52 MS; -459.60 LBF-IN @ 132.00 MS

CHANNEL: NEKYM2 FILTER: CH. CLASS 600

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 940131

200 COMPLIANCE TEST - CR0100

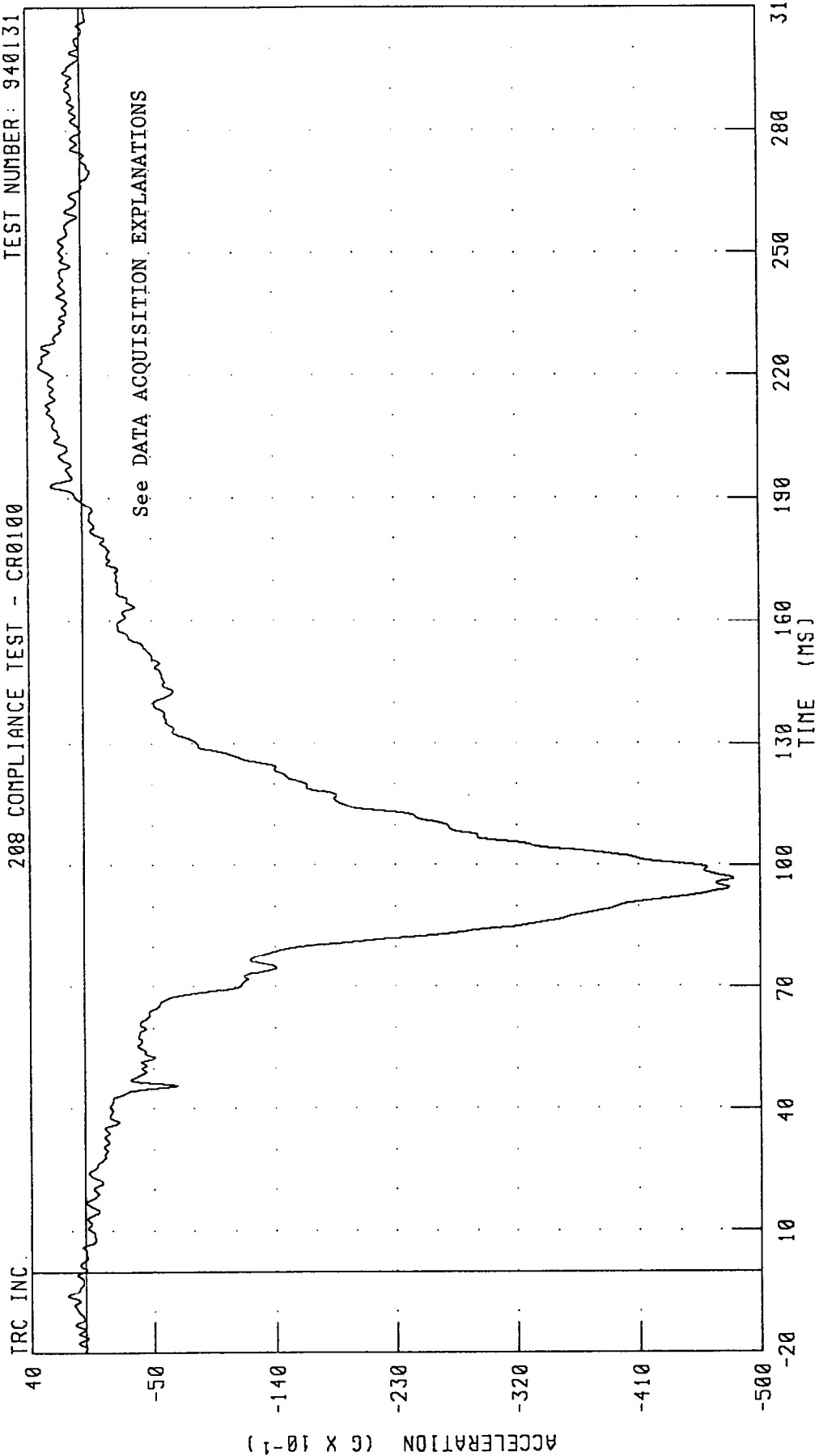


CHANNEL: NEKZM2 FILTER: CH. CLASS 600

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

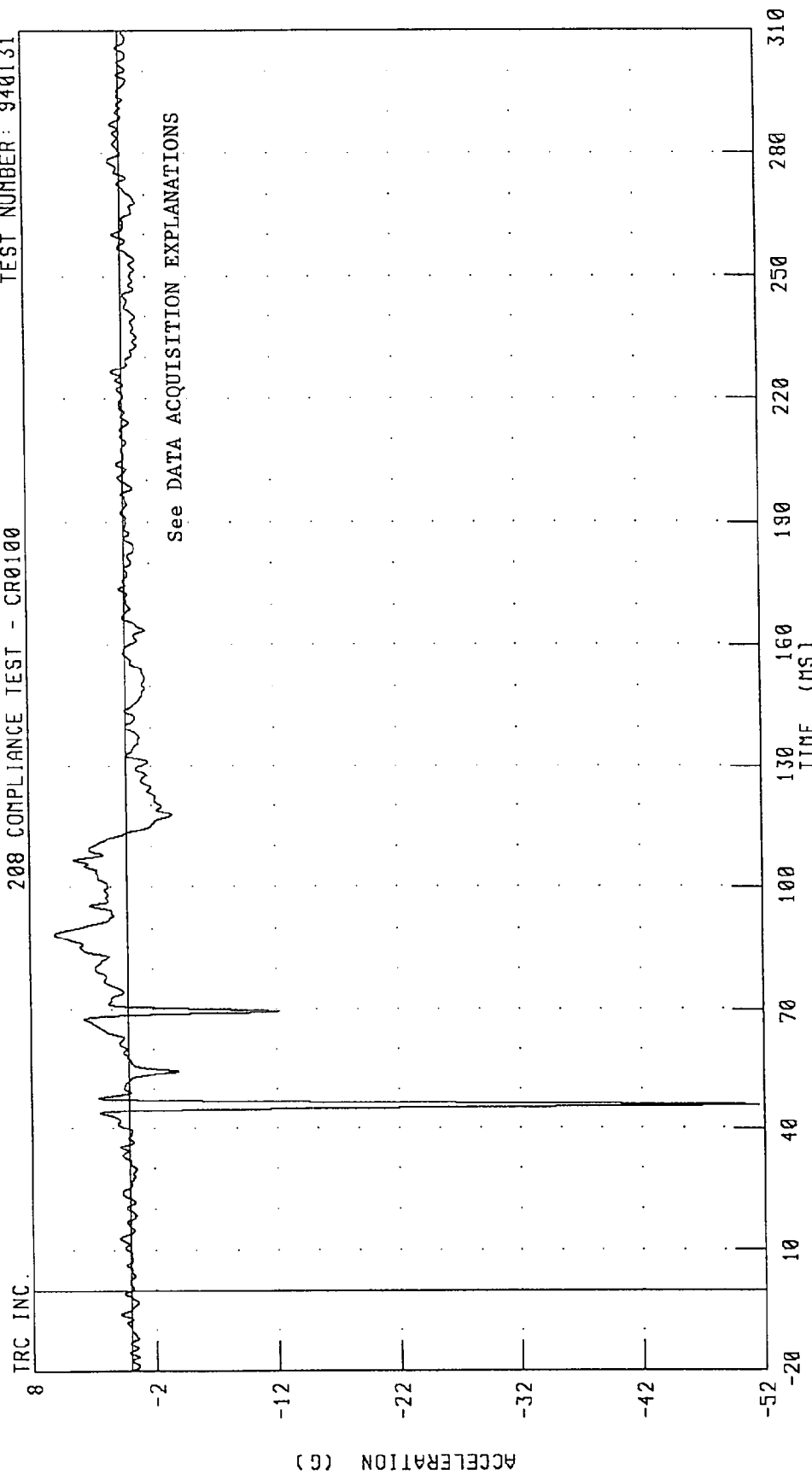


CHANNEL: CSTXC2 FILTER: CH. CLASS 180

PEAK DATA: 3.16 G @ 222.08 MS; -48.02 G @ 96.64 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION

208 COMPLIANCE TEST - CR0100 TEST NUMBER: 940131



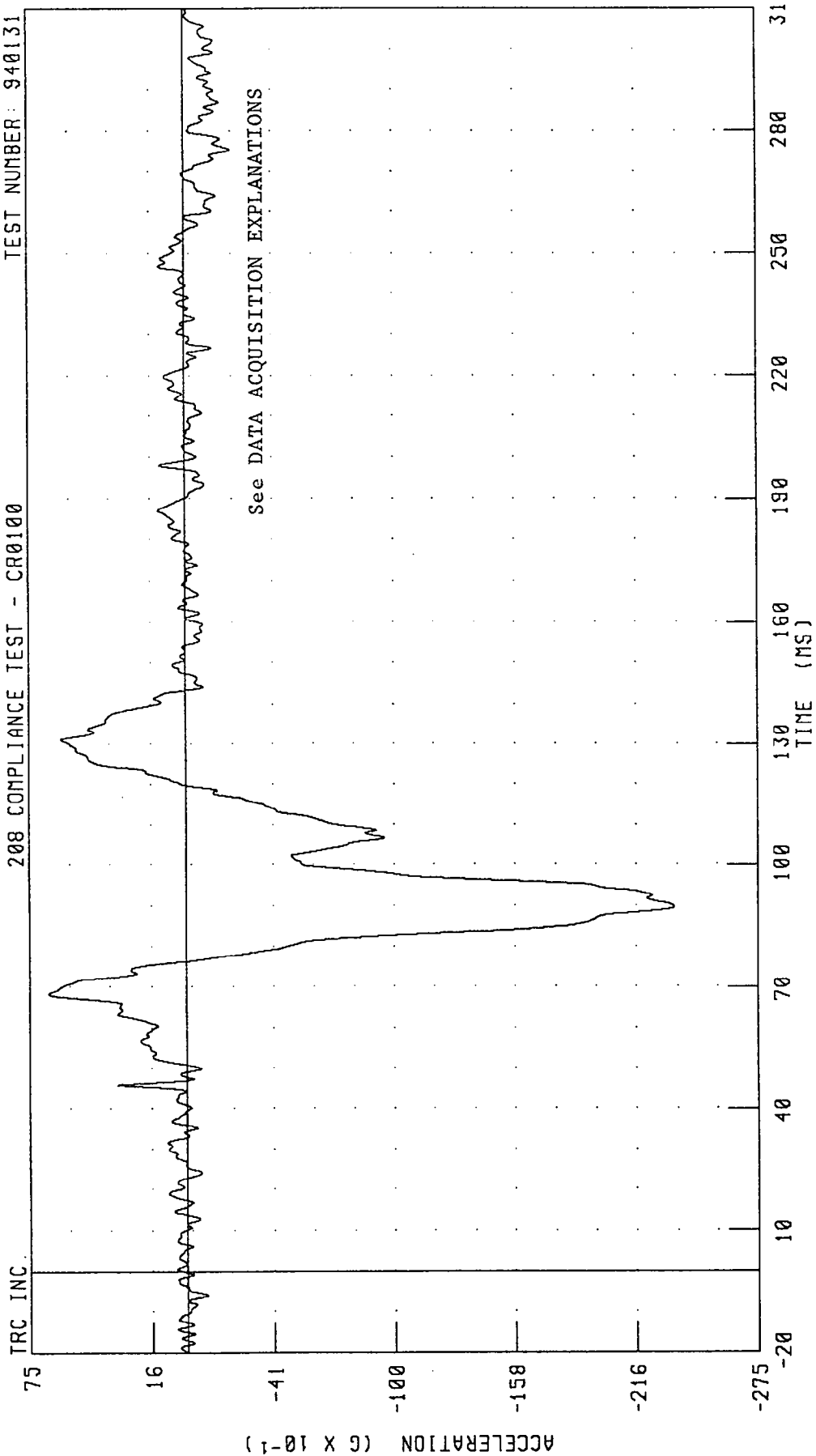
CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 5.96 G @ 88.56 MS; -51.56 G @ 45.92 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

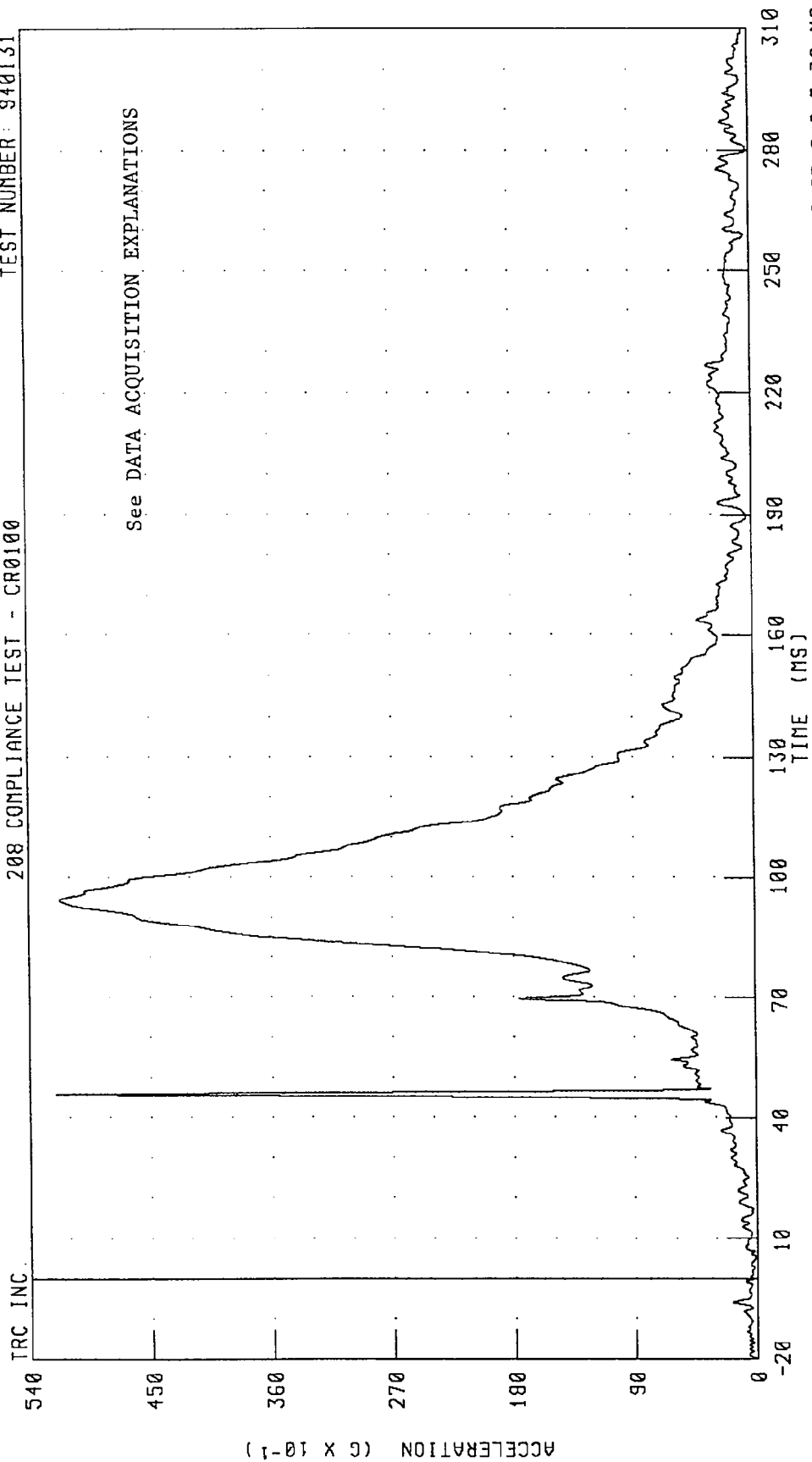


CHANNEL: CSTZG2 FILTER: CH. CLASS 180

PEAK DATA: 6.60 G @ 68.40 MS; -23.47 G @ 89.68 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

208 COMPLIANCE TEST - CR0100 TEST NUMBER: 940131



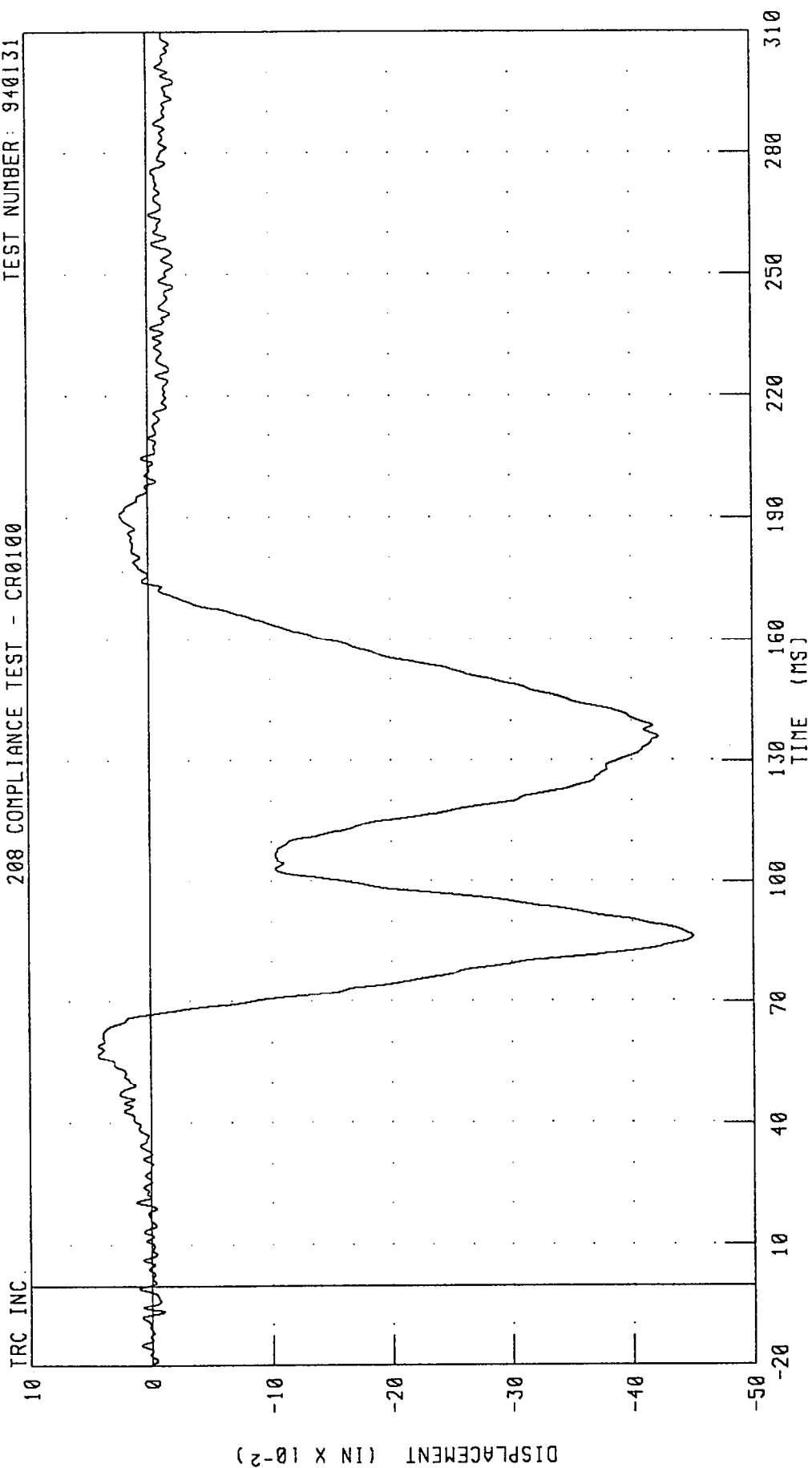
PEAK DATA: 52.11 G @ 45.92 MS; 0.05 G @ 5.36 MS

CHANNEL: CSTRG2 FILTER: CH. CLASS 180

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER CHEST DEFLECTION

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131



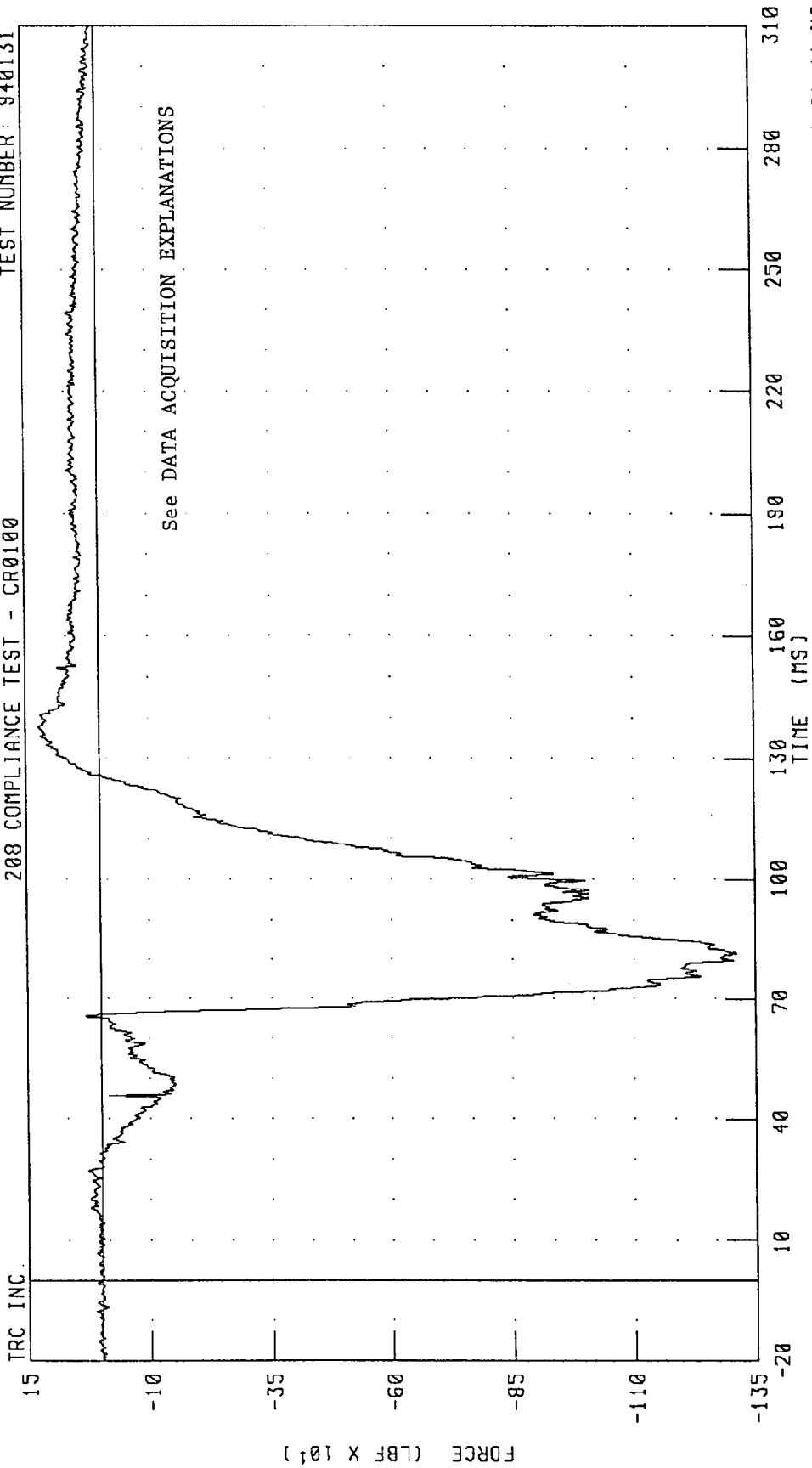
PEAK DATA: 0.04 IN @ 59.28 MS; -0.45 IN @ 86.40 MS

CHANNEL: CSTXD2 FILTER: CH. CLASS 180

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT FEMUR FORCE

208 COMPLIANCE TEST - CR0100

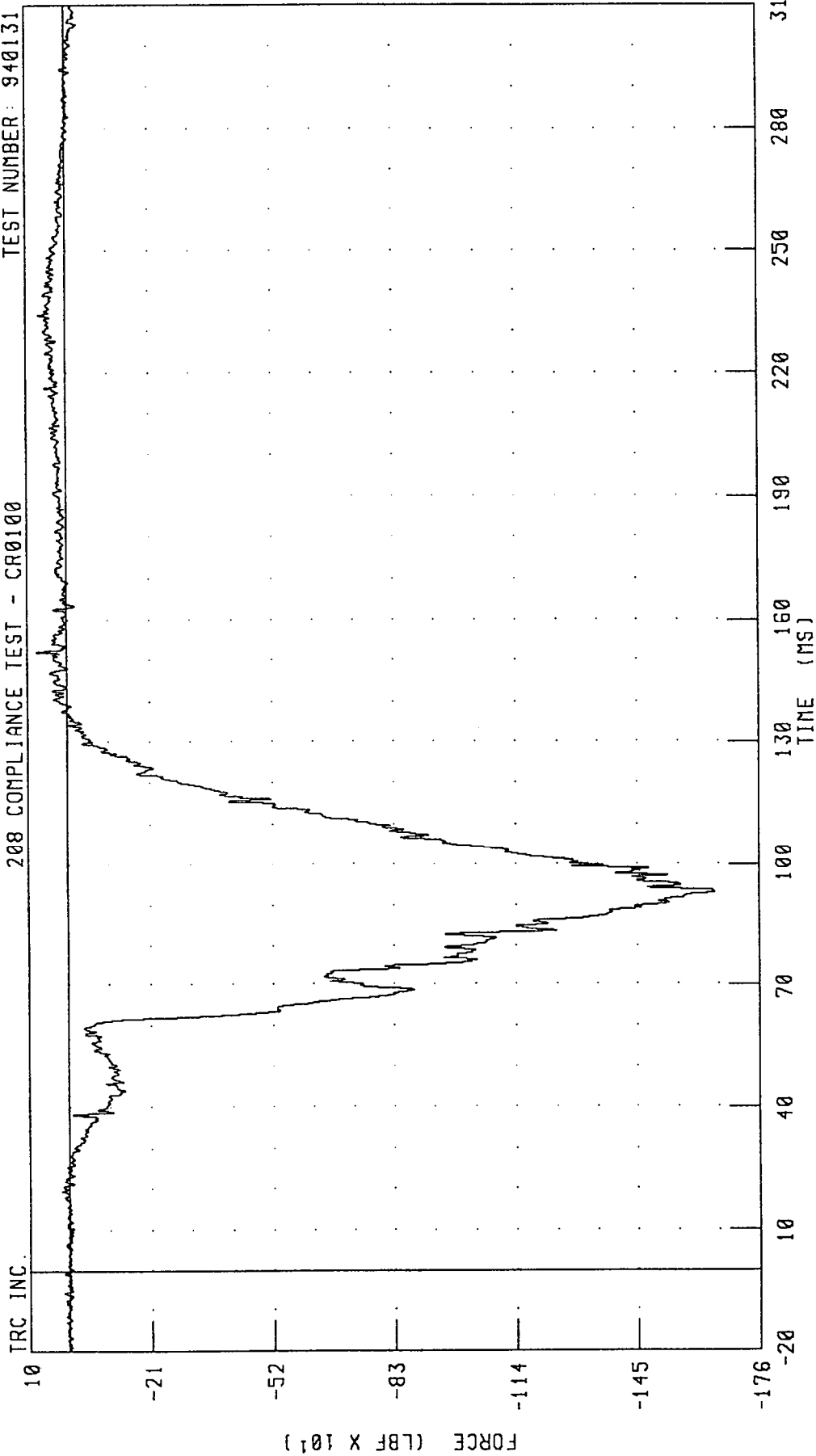
TEST NUMBER: 940131



1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100

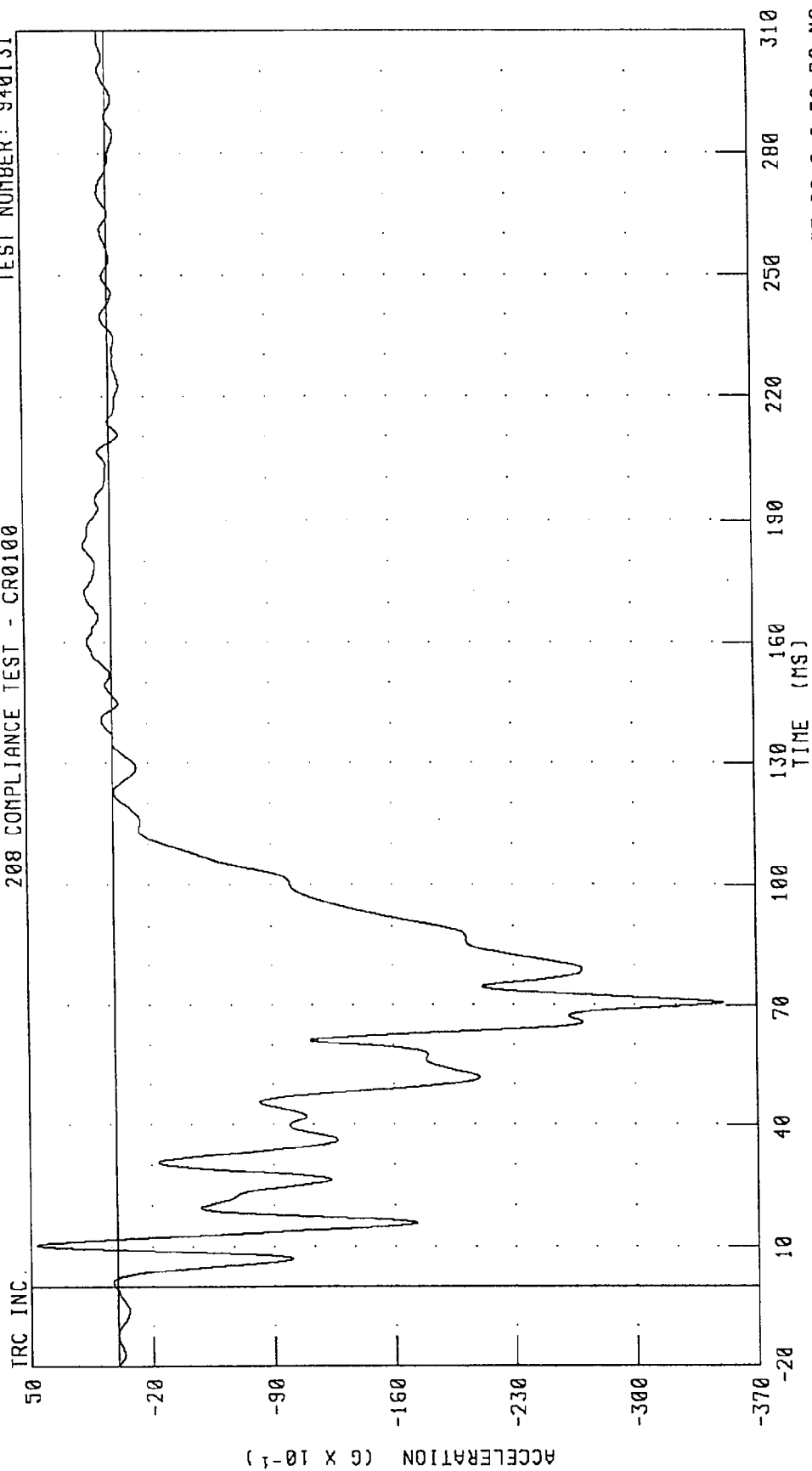


CHANNEL: RFMF2 FILTER: CH. CLASS 600

PEAK DATA: 75.35 LBF @ 152.24 MS; -1646.74 LBF @ 93.20 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 LEFT REAR SEAT X-AXIS ACCELERATION
 200 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

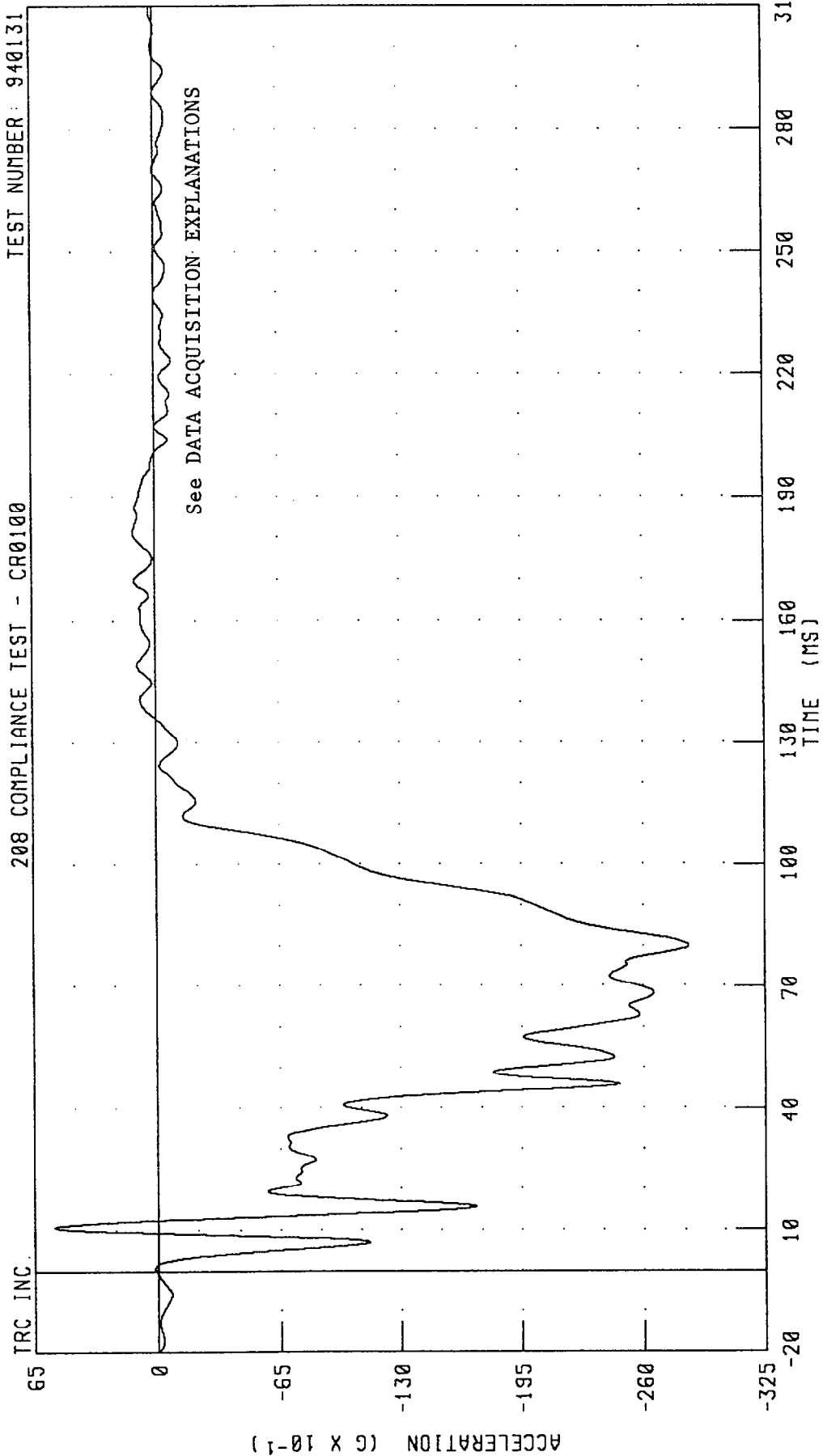


CHANNEL: TLRXG1 FILTER: CH. CLASS 60

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
 RIGHT REAR SEAT X-AXIS ACCELERATION

TEST NUMBER: 940131

208 COMPLIANCE TEST - CR0100

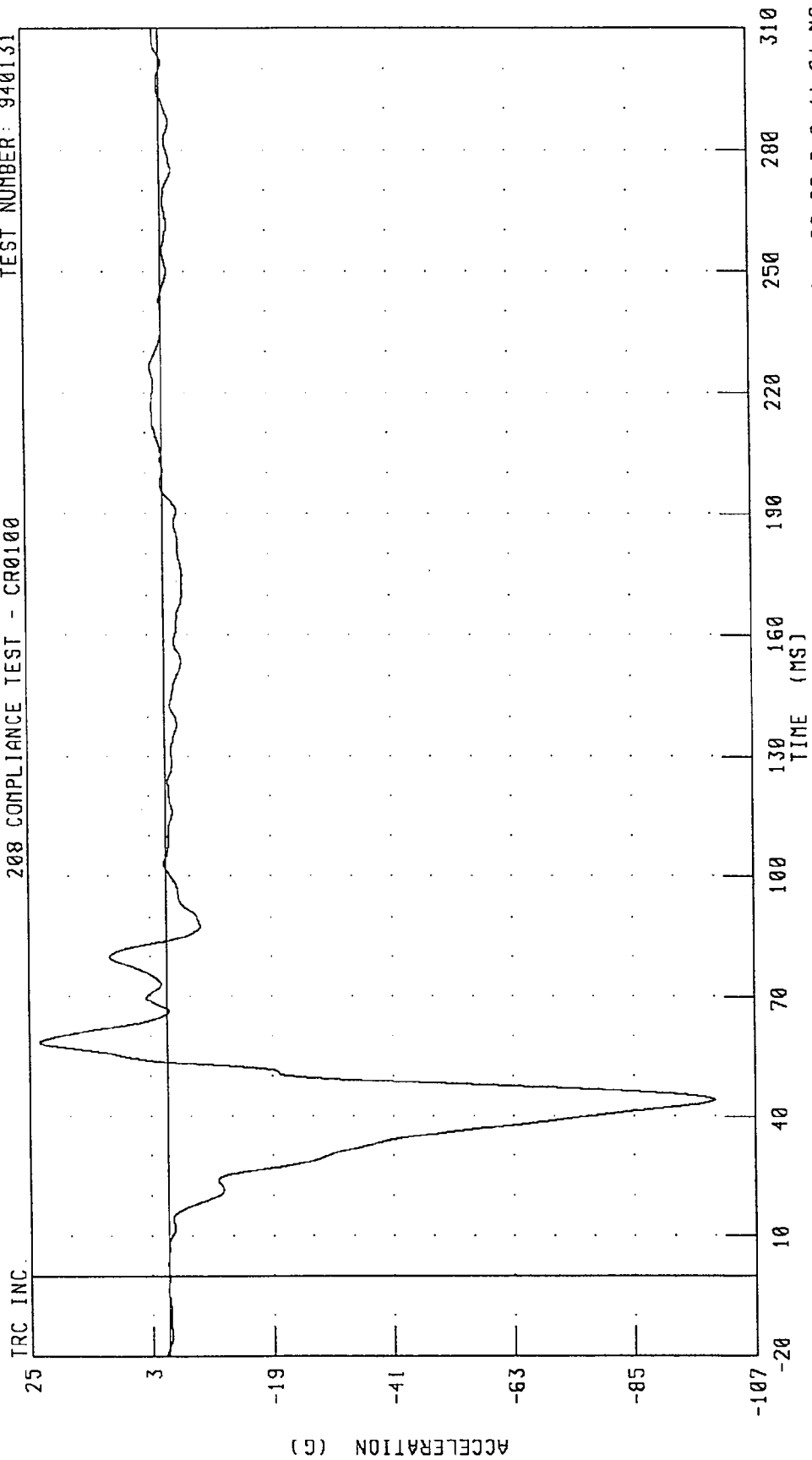


CHANNEL: TRRXG1 FILTER: CH. CLASS 60

PEAK DATA: 5.44 G @ 10.64 MS; -28.40 G @ 80.08 MS

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
ENGINE UPPER BLOCK X-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

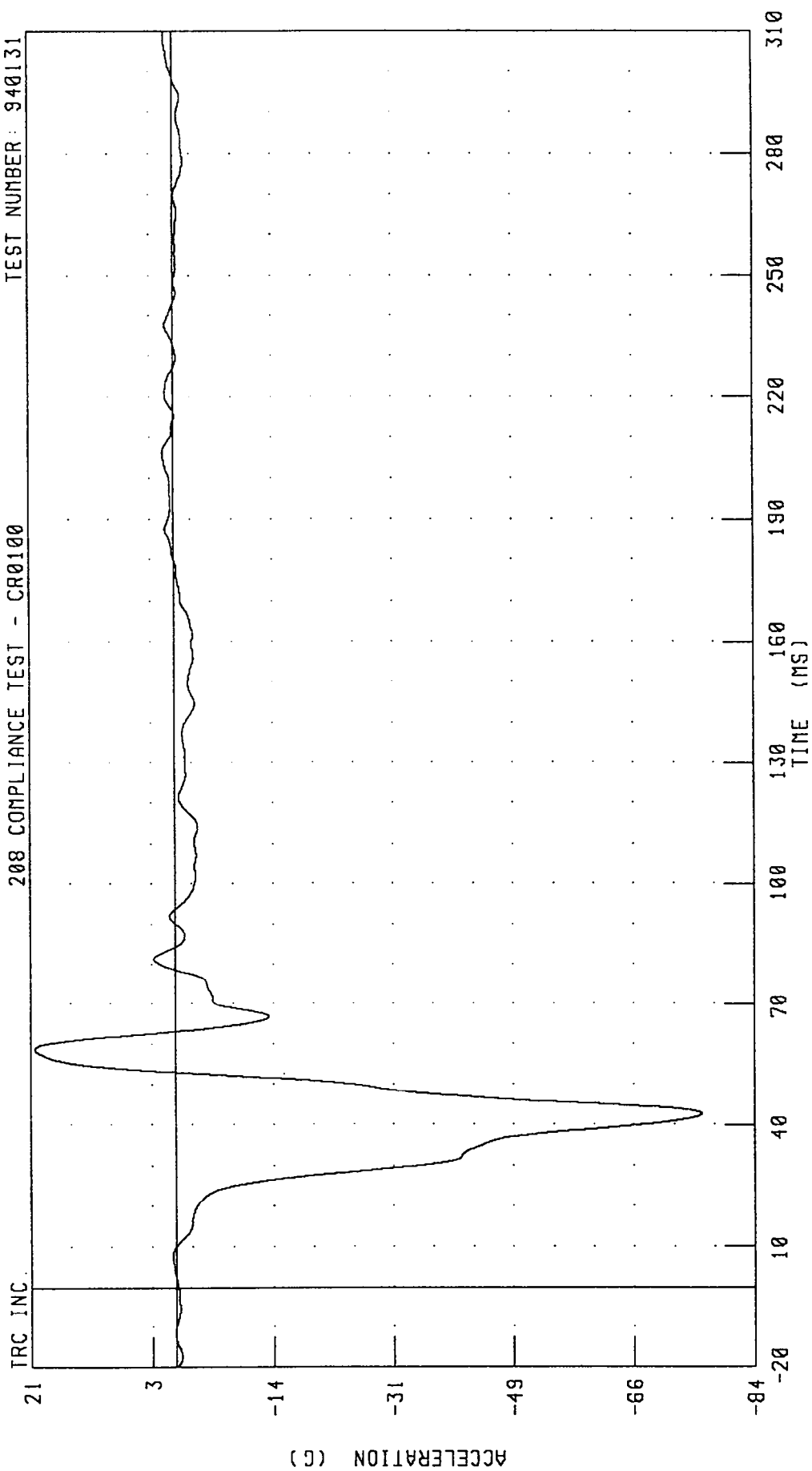


CHANNEL: ENCXC1 FILTER: CH. CLASS 60

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
ENGINE BOTTOM BLOCK X-AXIS ACCELERATION

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

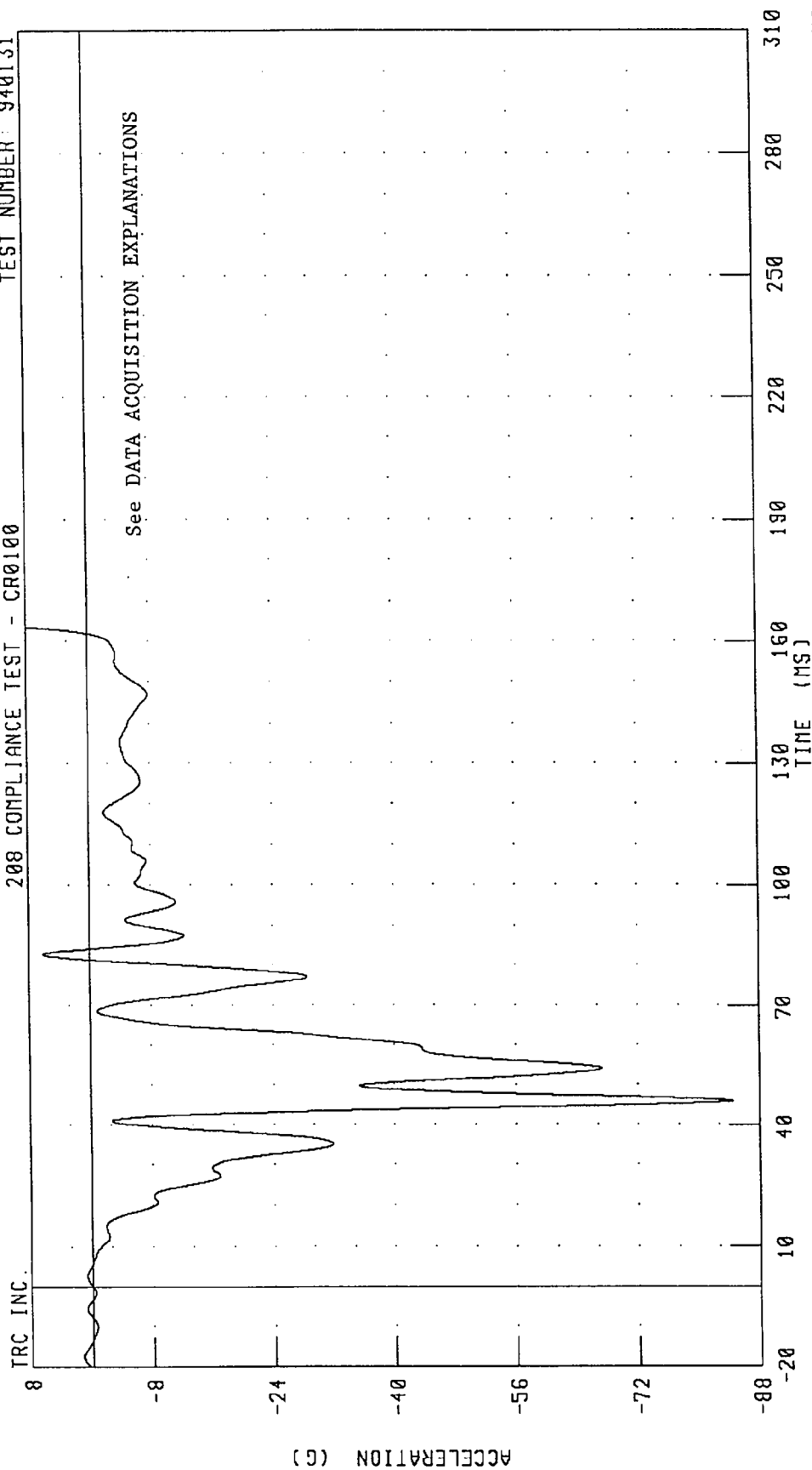


CHANNEL: ENGXC2 FILTER: CH. CLASS 60

PEAK DATA: 20.39 G @ 58.80 MS; -76.37 G @ 42.80 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

208 COMPLIANCE TEST - CR0100 TEST NUMBER: 940131



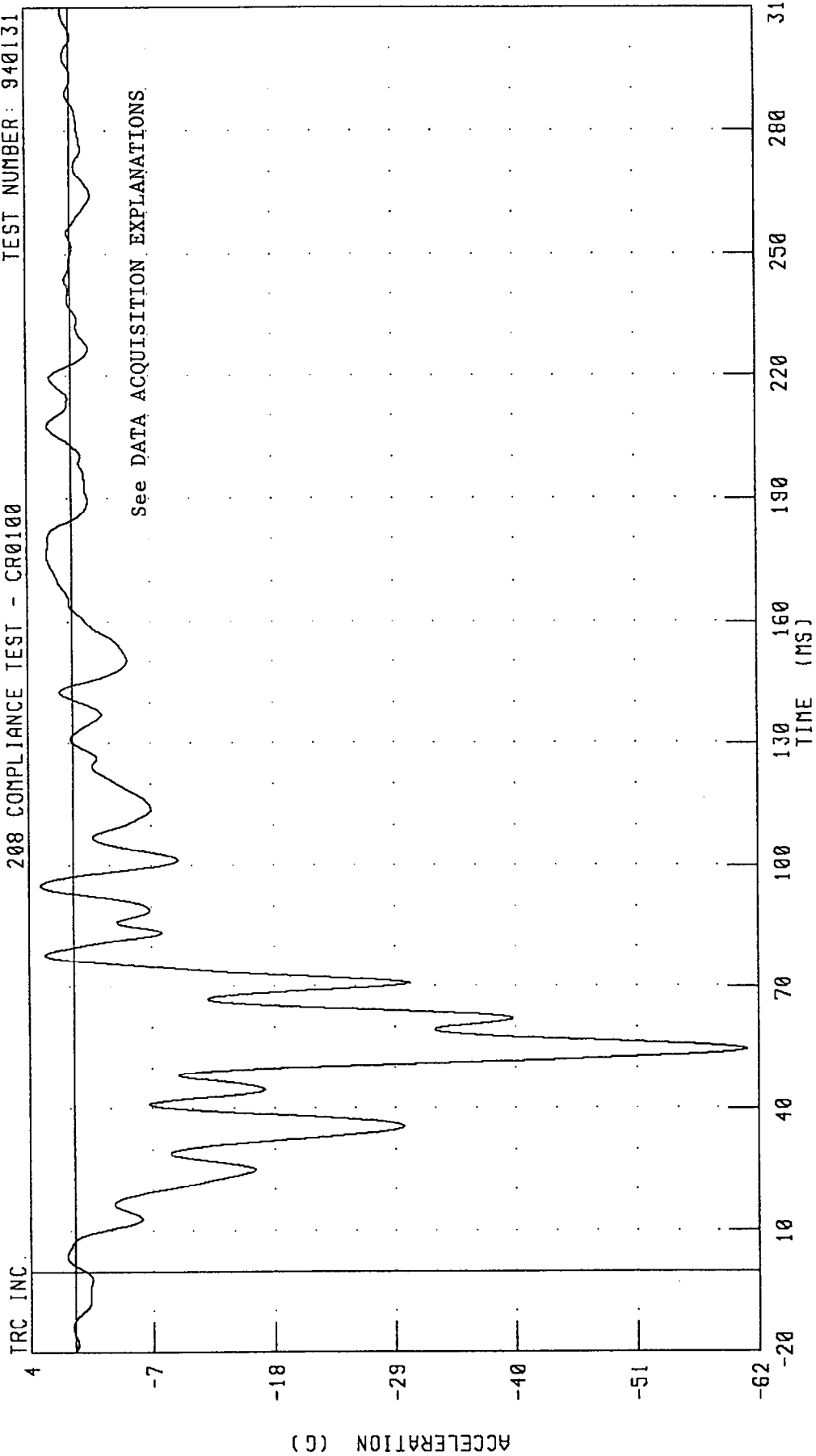
CHANNEL: BCRXG1 FILTER: CH. CLASS 60

PEAK DATA: 47.67 G @ 214.96 MS; -84.48 G @ 46.00 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

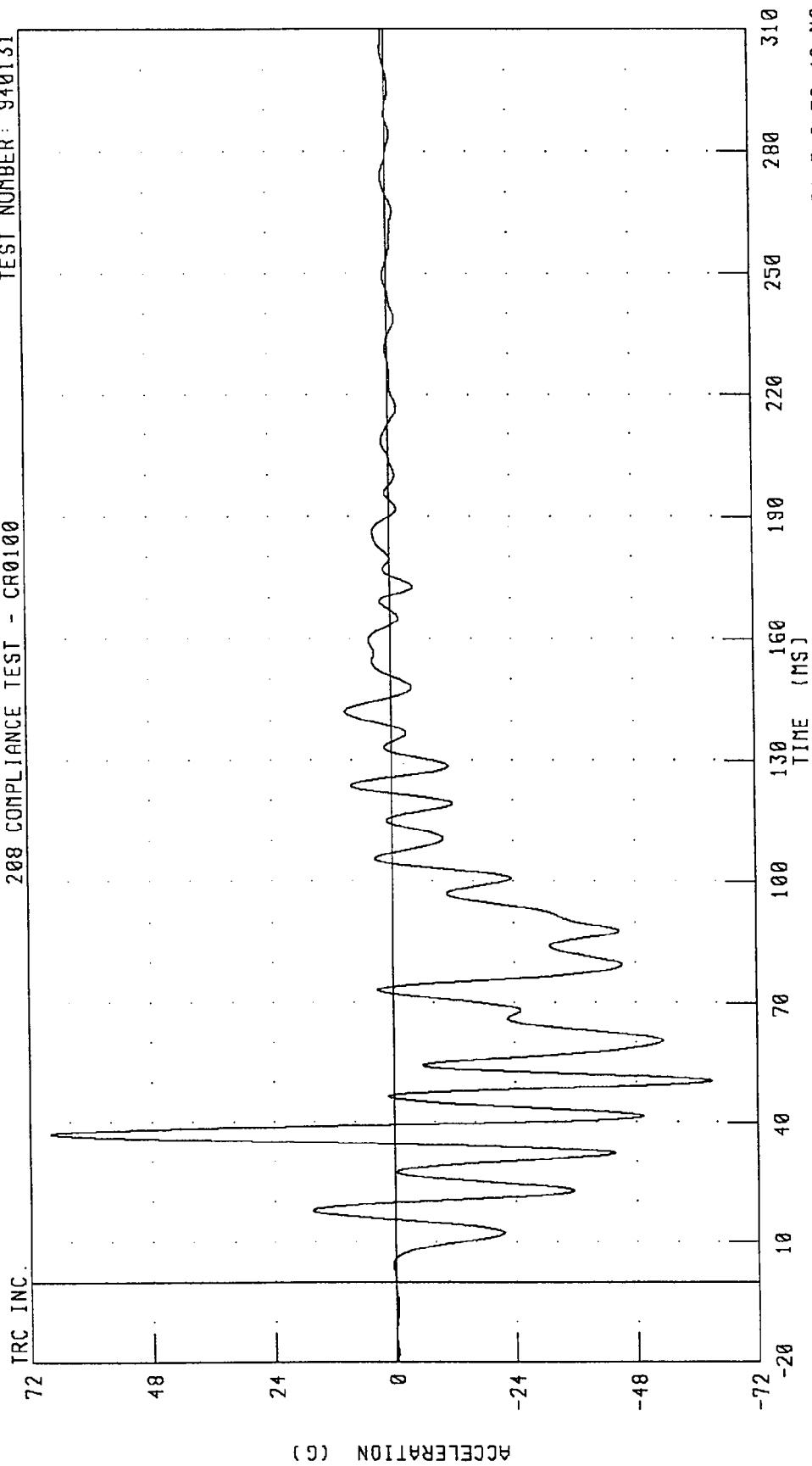


CHANNEL: BCLXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.94 G @ 95.20 MS; -60.92 G @ 54.64 MS

1994 CADILLAC CONCOURS INTO FLAT FRONTAL BARRIER
DASH PANEL CENTER X-AXIS ACCELERATION

208 COMPLIANCE TEST - CR0100 TEST NUMBER: 940131

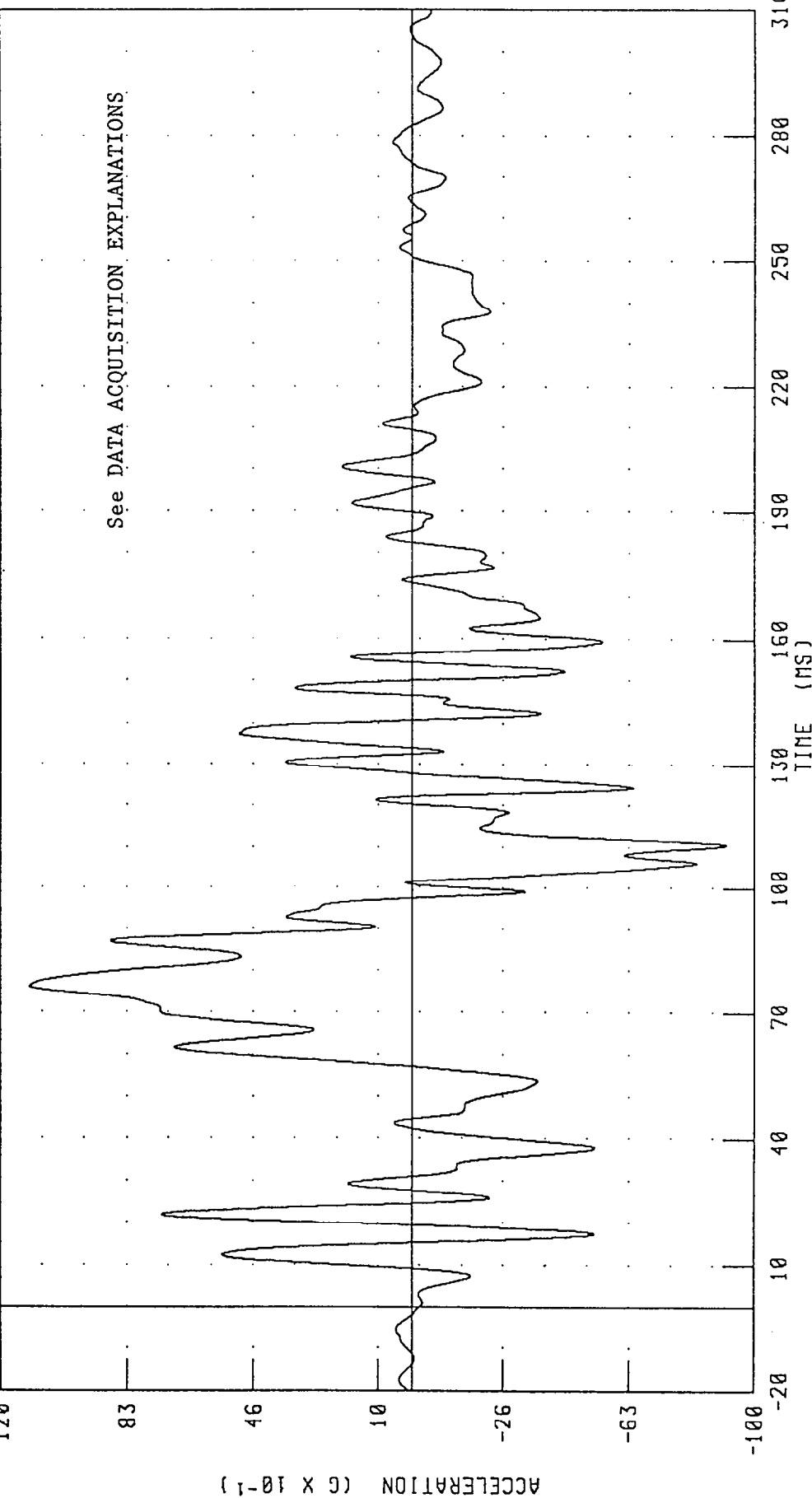


CHANNEL: DPCXG1 FILTER: CH. CLASS 60

1994 CADILLAC CONOURS INTO FLAT FRONTAL BARRIER
 VEHICLE REAR CENTER Z-AXIS ACCELERATION
 208 COMPLIANCE TEST - CR0100

TEST NUMBER: 940131

TRC INC.



CHANNEL: RDKZG1 FILTER: CH. CLASS 60

PEAK DATA: 11.15 G @ 76.24 MS; -9.18 G @ 110.64 MS